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Founder and Editor: STANLEY SPOONER

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EDITORIAL COMMENT

In a recent issue of *The Times* there appeared a leading article which bore marks of obvious inspiration, on the subject of the Army and the Air. To a certain extent this article assists to clear the air of some of the misgivings existing with regard to the duality of office which has placed

a single Minister in control of the Air Ministry and the Army, though it does not completely explain

The Army and the Air

away the anomalous position in which these two great Departments of State have been placed. The article begins by pointing out that our military system

in the last two or three years has been like an inverted pyramid, the apex being the old Regular Army, now worn so fine as to be incapable of supporting anything. Any policy of reducing the Army from a war to a peace footing demands a period in which the old Regular Army can be reconstructed. That would be so if there were no risk that the peace terms may need the support of force, or the display of force; but as the risk is a real one and cannot be disregarded, the case for the new scheme of reconstruction is doubly strong. The number fixed—900,000—should be large

enough for all emergencies, but no one can say yet for certain what the future size of our normal Army will be. It depends upon many considerations, technical as well as political. For example, how many infantrymen are we going to save on purely garrison work by the scientific use of air power? How many, for that matter, have been saved, thanks to air power, on the estimate of the provisional size of the Army until normal conditions have been restored? If, thinks *The Times*, a good many have been so saved, it goes very far to justify the temporary linking of the War Office and the Air Ministry under one head.

While we are not disposed to quarrel virulently with the point of view, we must point out that the argument smacks of speciousness, even a little of special pleading. The same argument might as easily be brought to bear upon the case of the Navy. How many ships can be spared from the ordinary work of peace-time by the scientific use of air-power? Undoubtedly some. And, in estimating the strength of the naval forces required to exert a possible pressure on Germany to enforce the terms of peace, it is probable that air power has come into the calculation to enable a reduction in the number of ships to be kept in commission. Then why not have placed the Navy under the Minister for War and the Air? *The Times* itself gives further point to this elaboration of the argument, as it proceeds to say that another good reason for the linking up of the Ministries of War and the Air is that when you have a policy like demobilisation to carry out, it must be viewed as a whole and as far as possible be carried out under a single inspiration. The great difficulty, it points out, in modern systems of government is to prevent national policy from being too much departmentalised. Government by departments has been justly called the worst of all forms of government, and one way of preventing its abuses is to group departments for some specific purpose. If demobilisation, it continues, is now proceeding smoothly and rapidly, that is due in no small measure to the unification of the policy of the two departments of the Air and the Army under one head.

Agreeing that it may be so—though we are not inclined to accept the point of view without qualification—again we would point out that the Navy seems to be having far less trouble with its demobilisation programme than either the Army or the R.A.F.,

although it has not the advantage of the "single inspiration." Naturally, we do not assume that it would of necessity be a worse thing if the Navy had that advantage. On the contrary, even naval demobilisation might have gone more smoothly had the three Services been grouped under a single head. The argument is a purely academic one, and we should not have referred to this aspect of the case were it not that we do not think it well to accept in its entirety the point of view enunciated by *The Times*. On the contrary, we still view the dual control with very serious suspicion and misgiving, even while agreeing that, as a purely temporary measure in the circumstances of the present, it may have its good points. *The Times* thinks that as a temporary measure it has been of real service, but it does not appear to be quite as certain of grouped administration as a permanency. Theoretically, it says, all the departments of defence—naval, military and aerial—should be one and under a civilian head, for under any other this union would make our constitutional system lopsided. But, however strong the theoretical arguments are, it would require years of patient, slow preparation before they could be applied safely. With which we entirely agree. Indeed, we said as much when writing a few weeks ago on the proposal to unify all three fighting Services under a Ministry of Defence.

**The
Objections**

All the theories are in favour of the grouped Ministry of Defence, but most of the practical considerations are in conflict with theory. As we pointed out in the previous article referred to, the grouping of all defence measures under a single head works out very well in the case of small Powers and our own self-governing Dominions, where the forces concerned are small and where, in particular, there is no necessity to be prepared for instant war on a relatively large scale. But in the case of a Great Power in which the fighting Services are of huge proportions, and which may be confronted at any time with exceedingly diversified problems of war, it is not at all so certain that the grouping of all under one head would work as well. If we take the case of Great Britain as typical—and that is the one with which we are solely concerned—we have a Navy of preponderant strength, which must always be kept at high-water mark of instant readiness for war. This connotes one set of problems, some of which are intimately related to those of the other fighting departments, but most of which are really domestic so far as the Navy is concerned. The latter is a force which is capable of waging war independently of the Army and even of the aerial arm as an arm pure and simple. In any naval war, aircraft must find their uses, but it need not connote the employment of an air force as a decisive fighting factor.

The Army depends upon the Navy for conveyance overseas and for the guarding of its sea communications. When those tasks have been adequately provided for, the Army conducts war "on its own." The Great War has afforded the greatest example in history of the proper relationship between sea and land power. We see at once that the war by land sets up a completely distinct set of problems for solution, problems which, as in the case of those affecting the sea war, are entirely peculiar to itself and require specialist training for that solution and a system of administration that is highly technical.

We come now to the consideration of air power, and again we see that the conditions are dissimilar to those of either of the other Services. Not only has air power to come to the assistance of sea and land power, as represented in the navies and armies, in order to increase their range of vision and striking power, but it is capable of carrying on war by itself and without the help of either. True, it cannot, as at present we are able to visualise it, carry on decisive war, but it is not at all certain that in the years to come decisions in war will not come from air power alone. It comes to this, that while the strategic aims of war whether waged by sea, land or air, are identical the methods of attaining them are quite dissimilar and call for a different scheme of organisation and administration in each separate case.

If we attempt to co-ordinate all three under a single administration it is easy to see that the task may be comparatively simple when the size of the separate Services is small. The proposition then becomes a workable one. When, however, they are each great Services like our own it is not at all so simple. As *The Times* itself points out, three such departments as these exceed the span of one man's mind, however gifted the individual. To be equal to such a task he would require the assistance of a General Staff composed of representatives of all three Services; and this staff would need a tradition behind it, and would have to acquire the habit of working in unison and seeing our strategical problems as a whole. This equipment is not made in a day and we must be content to advance slowly towards the ideal. If, *The Times* says, this is the ultimate goal, there is real usefulness in temporary associations and in any machinery which may break down the isolation of departments without, of course, impairing their internal independence.

There is an important qualification contained in this last sentence, and we need hardly say we agree with it. We can see how much good can come of such associations between the Air Ministry and the Admiralty and War Office, if these associations can be achieved *without the impairment of the internal independence of the Air Ministry*. It is just that which we fear—that the placing of the control of the youngest of the Services in the hands of the War Minister, subject as he must be to the influences by which he is surrounded at the War Office, will lead to the Air Ministry being placed in leading strings. If that can be avoided—though even now we doubt it—we are willing to admit that close association may have its advantages.

**Whither
are
We Drifting?**

While most of the Cabinet are in Paris, indulging in idealist discussion about wholly Utopian Leagues of Nations, we seem here to be drifting fast towards anarchy and chaos. Industrial unrest, mostly born of Bolshevik propaganda, is rife all over the country, and the deliberate attempt is being made to substitute for government by the democracy the rule of the mob-minority. The strikes in Belfast and Glasgow, and now that of the electric railwaymen in London, are all a part of the plot to defeat and destroy civilisation and to put in its place the form of anarchy which has reduced Russia to chaos and ruin. The Bolsheviks, headed by the man MacLean and his confrères, have frankly declared war on the Government, the community and the trade unions, with the avowed



Sir ARTHUR DUCKHAM, K.C.B., Director-General of Aircraft Production, Member of the Air Council

purpose of destroying liberty and getting the control of industry—and with it the government of the country—into their own hands.

Fortunately, the Government took a strong line in the matter of the threatened strike of the London electrical power workers, taking advantage of the powers conferred by D.O.R.A. to warn the men that they would render themselves liable to severe penalties if they persisted in holding the pistol to the heads of the people. That particular trouble, therefore, seems to have blown over for the time being. But it is perfectly apparent that this dealing piecemeal with troubles as they arise will do no permanent good. The trouble is too deep-seated for casual methods to be effective. They may stop a strike here and temporarily avert trouble there, but they cannot cure the evil. We have seen in connection with all these industrial troubles that the mass of the workers—and by workers we include those who work with their coats on as well as those who work in their shirt-sleeves—is thoroughly sound at heart. By far the great majority are content to reach their ideals by constitutional methods and, recognising that things cannot be altered by a stroke of the pen or a new heaven and earth created in a day, are willing to exercise a reasonable patience while adjustments are made. The great trade unions are sound and no one deprecates more than the real Labour Leaders the epidemic of irresponsible and utterly indefensible strikes which has broken out in most of the great industrial centres. The general public—which is really the workers—is getting restive under the infliction, and is very properly beginning to ask that the Government should justify its name and really govern in the name of the people. They say, and with perfect accuracy, that the Bolshevik minority which is causing all the trouble and which is known to be associated with all kinds of alien rogues and agitators, are as much traitors to the State as those who would have betrayed our armies to destruction during the war. We know what would have happened to the latter—they would have had very short shrift indeed. Yet we see permitted the sort of thing that went on at the Albert Hall last Saturday night, when speeches were permitted which reeked of treason and Bolshevism and not a single speaker of them all is a penny the worse. How long is this sort of thing to be permitted? Is the Government going to “wait and see” until the damage to our industries and our institutions has become irremediable, or are they going to take courage from the knowledge that they have the whole sense of the community behind them, and take drastic action to stop the open propagation of treason?

The Disposal of Surplus Aircraft Equipment

In connection with the disposal of surplus State property an Advisory Council, of which Lord Salisbury is chairman, has been appointed to advise the Minister of Munitions on such questions as may be referred to them. The organisation consists of a Board, directly responsible to the Minister, to be called the Surplus Government Property Disposal Board, of which Mr. F. G. Kellaway, M.P., Deputy Minister, is chairman and Major F. C. T. Tudsbery, O.B.E., Secretary. The departmental organisation is divided into 17 sections to deal with the different classes of property. At the head of each of these sections is a Controller responsible to the Board. One Section will deal with Aircraft Equipment, but the Controller has not yet been appointed. He will have the assistance of a honorary advisory committee to ensure that the various classes of property are disposed of to the best advantage, and the following have been invited to serve on this Committee:—Brig.-Gen. W. Alexander, C.M.G., D.S.O.; Mr. J. D. Siddeley; Mr. H. White-Smith.

Communications should be addressed to the Secretary,

If there are no other powers to hand, D.O.R.A. is still alive and it would be a comparatively simple matter to deal with the firebrands under her provisions. While we may not possibly be in complete agreement with the course we hear suggested in every railway carriage and public place—that the agitators should be arrested and shot out of hand—we do think the Government would be absolutely justified in deporting them to a place where they could do no harm. There is Tristan d'Acunha, for example, which would do admirably for the purpose and where there are no natives to speak of who would be likely to suffer from association with people of the MacLean type. There are other places more comfortable from the climatic point of view where these gentry could be rendered equally harmless, but wherever they might be deported to it is quite certain we can do better with their room than their company here. And what about the alien agitators who are assisting with the revolutionary propaganda? Are they to be allowed the right of asylum the while they abuse the privilege? We notice that the Unionist Labour Party has just passed a resolution with which we are in cordial agreement. It declares that the need should be impressed upon the Government of taking steps at the earliest possible moment to repatriate all enemy aliens, interned or not, now in this country, and that the Government be requested to secure the early repatriation of all aliens, whether subjects of Allied or of neutral countries, who have settled in this country since August, 1914, and who have taken up positions which were vacated by British men and women enlisted in the service of the country. We cannot see that the slightest exception can be taken to either measure. We certainly do not want the continued presence of enemy aliens—however high their connections or lowly their station—they should be sent back to feed from their own trough. Nor do we see why other aliens, even Allied, should remain to fill the posts that properly belong to our own countrymen and women. By all means let them be repatriated. We would go even farther and say that our own Government ought to consider following the example of that of the United States, which has entirely prohibited all immigration in the meantime. At least the Aliens Act should be so tightened up as to make the ingress of Bolsheviks and revolutionaries impossible. At present they seem to come and go pretty much as they list, while the mere British person often cannot get permission to travel abroad in the interests of our own commerce. We are indeed a peculiar people and a long-suffering one!

Disposal Board, Armament Place, Whitehall Buildings, S.W. 1.

More Aeroplanes for Canada

In accepting a squadron of 50 aeroplanes presented by Lord Londonderry, on behalf of the Air Ministry, to the Canadian military authorities, Sir Edward Kemp, Minister of the Overseas Military Forces of Canada, said that when the Armistice was signed arrangements had just been completed for two independent Canadian squadrons to work in France and Belgium in co-operation with the R.A.F. These two squadrons, fully trained and equipped, would return to Canada to form the nucleus of a Canadian Air Force for military and commercial purposes. He also said that between 13,000 and 14,000 Canadians had been connected with the R.A.F. during the War, and of these 1,239 officers had been transferred from the Canadian forces to the R.A.F., and 4,280 fully-trained flying officers had been sent direct from Canada.

The squadron presented to Canada was part of a fleet of aeroplanes over 200 in number given to the Imperial Government through the Overseas Club and Patriotic League.

THE POSSIBILITIES OF AIRSHIP TRANSPORT SERVICES*

Synopsis of Contents

I.—Summary. II.—General Remarks. III.—Proposed Services and Routes. IV.—Proposed London-New York Service. V.—Estimated Cost of Atlantic Service. VI.—Financial Working Arrangements; Subsidies. VII.—General Specification of Proposed Airship. VIII.—Aerodromes, Sheds, and Equipment. IX.—Weather. X.—Navigation. XI.—Comparison of Airships and Aeroplanes. XII.—Comparative Aeroplane, London-New York Service. XIII.—Pre-War German Airship Passenger Services.

SECTION I.—Summary of the Most Important Conclusions in this Paper.

The outstanding and peculiar advantage of the airship for air transport is its capacity for making non-stop voyages of long duration; whereas from inherent limitations, the aeroplane will probably never—unless some radically new principle of design is discovered—be capable of carrying a passenger load for greater non-stop distances than 2,000 miles, and for economical operation, will probably never be used for non-stop flights of more than 1,000 miles; whereas, on the other hand, the only limit to the non-stop length of flight that can be made by an airship is determined by the size of ship, and 10,000 miles is quite practicable.

An airship of the size described in this paper, of a capacity of 3,500,000 cub. ft., which could be built immediately and be housed in existing sheds, can carry 15 tons of passengers, mails, etc., for an air distance of 4,800 miles, at a speed of 60 m.p.h., and it would be quite a practicable proposition to build a rigid airship to carry 50 tons of passengers and freight for a non-stop voyage of 10,000 miles, at a speed of 80 m.p.h. It therefore may be definitely accepted that for voyages on which it is necessary to make a non-stop flight between points more than 2,000 miles distant, the airship is the only means of aerial transport possible, and it may also be safely stated that the airship will always be the most economical means of transport for non-stop voyages of more than 1,500 miles. It, therefore, is inevitable that the airship will hold the field for long distance cross-oceanic air voyages.

Cost of Operation.

As a basis for comparative figures, the direct non-stop passenger voyage from London to New York (a minimum distance of 3,000 miles) has been considered, and an analysis made of the cost of operating a service of two crossings in each direction per week, giving a carrying capacity of 30 tons of passengers, mails, etc., in each direction. Details of this cost analysis are given in Section V. The results may be summarised as follows:—Capital required: £2,600,000.

Allowing 10 per cent. on capital, and a high rate of depreciation and insurance, etc., the cost of operation would be as follows:—Carrying passengers from London to New York

* Issued by Vickers, Ltd.

£45 per head, which is equivalent to 4d. per passenger mile. The rate for mails, etc., would be 3d. per ounce.

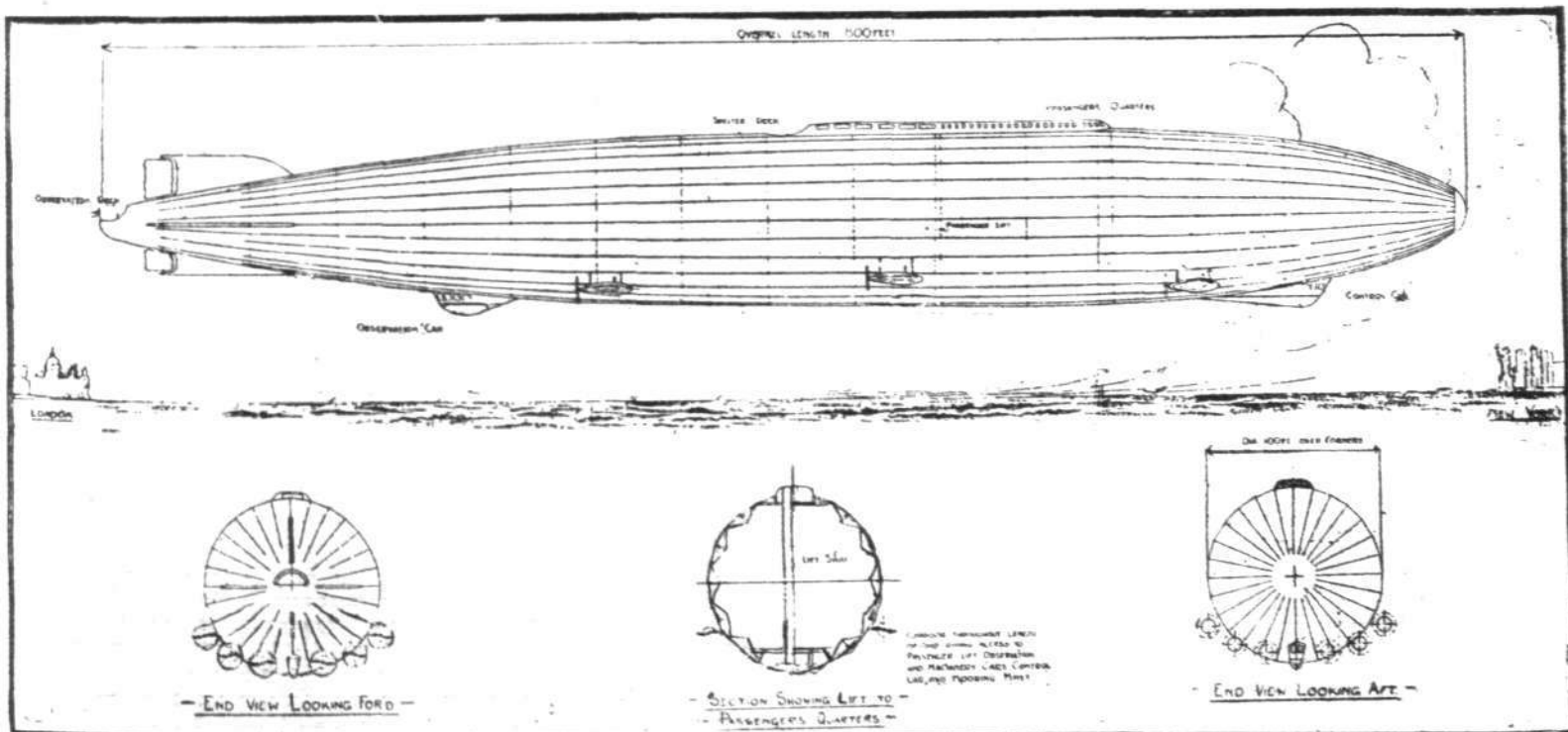
The time taken for the journey would be two and a half days from London to New York by the southerly route, and two days from New York to London by the direct route.

It is impossible to run an aeroplane service direct from London to New York, but with the largest and most efficient machines at present considered practicable, it would be possible to run a London to New York service with intermediate stops in Ireland and New Foundland for replenishment of fuel, etc. An analysis of the cost of running an aeroplane service on this basis is given in Section XII, from which it will be seen that to give the same service as the airships proposed, the capital required would be: £3,850,000, and the cost of operation on the same basis as the airships would be:—Passenger rate, from London to New York, £115, which is at the rate of 9d. per passenger mile. Mails at the rate of 7½d. per ounce.

The time taken, allowing for stops in Ireland and New-foundland, would be two days. It is, therefore, seen that for a regular and established service, the cost of Atlantic transport by airship is less than half of that by aeroplane, and the time taken practically the same. It must, however, be pointed out that if the airship stopped at the intermediate points as necessary for the aeroplane, a considerably greater amount of passenger load could be carried, and the relative cost by airship would be considerably further decreased. With the development of airship transport to the most distant centres of the world, it is conceivable that no important city will be further from London than 10 days' journey, and the following table gives the times that would be taken to reach several important cities when airship ocean routes are in operation:—

Times from London in Days.

To New York	2—2½ days.
To San Francisco	4½ "
To Cairo	1½ "
To Colombo	4½ "
To Perth	7 "
To Nairobi	3½ "
To Capetown	5½ "
To Rio Janeiro	4 "



VICKERS PROPOSED RIGID AIRSHIP.—This ship is to have a capacity of 3,500,000 cub. ft. The passengers' quarters, it will be noticed, are on top of the hull, and not, as is the usual practice, underneath. The passengers will enter the ship through the extreme nose, and will pass through a corridor to the shaft of the lift which will convey them to their quarters.

As the maximum distance of direct flight between intermediate stations required to get to any of these centres is not more than 3,500 miles, it would be practicable to run these services with the size of airship described in this paper, and the cost of operation for a regular service would be approximately as for the Atlantic service, *i.e.*, passengers at the rate of 4d. per mile, and mails at the rate of 3d. per ounce, and with the development of large airships carrying greater loads, the cost of operation would be even more economical.

It is probable, in view of the immense benefits that would be conferred on civilisation by the great saving in the time required for travelling, that the various Governments will be prepared to subsidise the development and operation of the airship services in their initial stages until a fully operated service could be established. Incidentally, the commercial use of airships for passenger flights was demonstrated in Germany before the War, when the Hamburg-America Steamship Co. ran a series of passenger airships for purely pleasure purposes at a profit, and carried 17,000 passengers without a single accident or mishap. From the description of the type of airship proposed in Section VII, it is apparent that every reasonable provision can be made for comfort of the passengers, and suitable sleeping accommodation provided for the long journeys. For the operation of airship services, aerodromes are only required at the terminal stations, and landing places with mooring-out towers need only be provided 3,500 miles or more apart.

The necessary amount of work in constructing the stations and preparing for the operation of an airship service is relatively small, whereas a long distance aeroplane service is only practicable if aerodromes can be provided every 1,000 miles, and for safety it would be necessary to have suitable landing grounds for use in case of forced landings no further apart than 100 miles. The preparation and cost of all these aerodromes and landing grounds would represent a large amount of preparatory work required to be done before long distance aeroplane service could be put into practicable operation. The problem of landing and housing the airship in stormy weather has now been solved by the use of the mooring mast or tower to which the airship is moored by the nose, and able to ride out in any weather clear of the ground. Arrangements are also provided whereby the airship can easily be moored to, or released from the tower in any wind up to 60 miles per hour, without difficulty. The passengers can get into or out of the ship by means of a lift in the tower. There therefore will be no need to put the airship into a shed except for periodic overhaul and refit.

SECTION II.—The Possibilities of Airship Commercial Services.

Although no claim is made that airships will seriously compete with ordinary transport services at present satisfactorily served by railways and ocean liners, there is no doubt that a sufficient number of passengers would be prepared to pay relatively higher rates for the great saving in time taken for long distance journeys, particularly for long sea journeys, and also, to get a direct and fast service to important centres which are not at present served direct by railway systems or ocean transport. The demand would mainly be for passenger traffic to serve the requirements of business men who require to get from centre to centre in the shortest possible time, and also for the carriage of express mail matter. Other services on which large airships would be particularly useful would be:—For carrying freight of high intrinsic value, such as transporting valuable ores and other commodities of high intrinsic commercial value from places otherwise inaccessible, or not provided with other means of direct transport. In making preliminary exploration of large virgin tracks of country for the purpose of constructing railway tracks, etc., a great amount of laborious exploration work would be eliminated. There are also great possibilities of obtaining a profitable return by running airships for pleasure trips from seaside or other resorts in the summer months, where an almost unlimited number of people would be prepared to pay a fairly good price for airship cruises. A particular instance for which it is thought such services could be profitably run would be at Blackpool, where pleasure cruises could be run to the Isle of Man, or to the Lake District.

There might also be a limited demand from private owners for a small non-rigid airship, to carry two or three passengers, which could be run at much the same cost as a small yacht. It is probable that in order to meet the requirements of these various purposes—for which airships conceivably will be utilised—airships will be designed of three classes, *viz.*:—First, the airship of moderate size and high speed, for carrying express mails and passengers. Secondly, the passenger liner

for passenger traffic, of a large size, and high speed. Thirdly, large airships of comparatively slow speed, and large carrying capacity, for general transport.

The small non-rigid airship will hold the field for use for private purposes.

The rigid airship is as yet only at the beginning of its development, particularly as regards size and carrying capacity. The airship of 3,500,000 cub. ft. capacity—the size proposed in this paper—for immediate use on the fast passenger services, which would have a maximum speed of 75 m.p.h., and would carry a useful load of passengers of 15 tons, for a distance of 4,800 miles, could be built immediately and could be housed in sheds at present available. As, however, the lift and speed efficiency of a rigid airship increases rapidly with increase of size, it will be advantageous to use the largest airships that can be economically operated, and a rigid airship able to carry 50 tons of passengers and freight for 10,000 miles, at a speed of 80 m.p.h. is quite feasible, and the design and construction of such an airship could be undertaken immediately it would be justified by developments in the demand for air transport. Passenger cruises on a commercial scale were operated in Germany for about four years before the War by the Hamburg-America Steamship Co., and it is understood that companies have been formed in Germany for Zeppelin airship services from Berlin to Constantinople, and notices have recently appeared in the Press that the German Zeppelin Company is now actually building airships for the Berlin-New York service, and other routes. Notices have also recently appeared in the Press to the effect that the Spanish Government have decided to make enquiries into the possibilities of running trans-Atlantic services from Spain to the United States of America. It is conceivable that by the development of aerial transport, no important city will be further from London than ten days' journey.

SECTION III.—Proposed Services and Routes.

The advantages of airship transport will be most apparent for long ocean journeys, and it is proposed that the best route for the first service would be between London and New York, as this is the route on which there is the greatest demand for a saving in the duration of voyage, and a large amount of passenger traffic would be immediately available once the advantages of the service were demonstrated.

London to New York.

This is dealt with in detail in Section IV.

After the establishment of the Atlantic service, other services on which airship transport would effect great economies in time would be the following:—

London to India and Australia.

London to Cairo	.. .. .	2,050 miles.
Cairo to Colombo (via Aden)	.. .. .	3,400 ..
Colombo to Perth (Australia)	.. .. .	3,150 ..

At an average speed of 60 m.p.h., and with a stop of 12 hours at each station for re-fuelling, etc., the times taken would be the following:—

London to Cairo	..	34 hours, or 1½ days.
London to Colombo	..	34 + 12 + 58 hours = 104 hours = 4½ days.
London to Perth	..	104 + 12 + 52 hours = 168 hours = 7 days.

By train and mail steamer, the journey to Ceylon at present takes 15 days, and to Australia takes over 30 days.

Cairo to Capetown.

Cairo to British East Africa (Nairobi)	..	2,100 miles = 35 hours.
British East Africa (Nairobi) to Cape-town	..	2,200 miles = 37 hours.
Total time from Cairo to Capetown, allowing stop for 12 hours at Nairobi,		84 hours or 3½ days.
Or from London to Capetown,		5½ days.

Other possible routes for airship services are shown on chart.

Further than the saving in time in the actual journey there is the saving by using an airship service in the elimination of the time taken for trans-shipping and waiting at the various ports, etc., where the aerodromes could be situated quite close to the terminal stations. Owing to the variation in weather conditions, there would be of course some latitude in the time of arrival at the destination, but in these cases where there is a saving of several days in the total journey, the variation of a few hours in the time of arrival would not be of much account.

Size of airship required for the above services.

It will be noted that the maximum distance of voyage required for any of the services stated above is 3,500 miles, which at a speed of 60 m.p.h. would require a ship able to fly

CHART SHOWING PREVAILING WINDS AND PROPOSED ROUTES.—The times (in days) taken by the various journeys is expected to be approximately as follows:—London to New York, 2½. San Francisco, 4½. Cairo, 1½. Colombo, 4½. Perth, 7. Nairobi, 3½. Capetown, 5½. Rio de Janeiro, 4. On the chart the arrows indicate the direction of the prevailing winds. The continuous arrows denote steady winds. The short arrows denote variable winds, whose prevalent direction is that of the arrow. The dotted arrows denote winds under 15 m.p.h. velocity, the thin arrows denote winds from 15 to 20 m.p.h., the slightly thicker arrows indicate winds having a velocity of 20 to 27 m.p.h., while the thickest arrows denote winds above 27 m.p.h.



at this speed for a minimum of 60 hours, and in order to allow for loss of time on the way owing to adverse weather or other reasons, it is considered that an airship able to do 80 hours' flight at a speed of 60 m.p.h. would meet all the conditions. It is proposed that the airship should have a full speed at maximum power of 75 m.p.h., but she would generally only fly at reduced power, giving a speed of 60 m.p.h., the additional power being held in reserve to enable the additional speed to be utilised for getting through storm areas or going against adverse winds.

SECTION IV.—Proposed London to New York Service

1. Specification of Proposed Airship

(A complete specification is given in Section VII)

The Main Particulars to be as follows.

Gross gas capacity	3,500,000 cub. ft.
Normal total lifting power	105 tons.
Disposable lift	68 "
(The "disposable lift" is that available for fuel and oil, stores, crew, passengers and mails.)	
Total engine power	3,500 b.h.p.
Speed at full power	75 m.p.h.
Normal flying speed with 2,000 b.h.p. ..	60 "
Consumption of petrol .. .. .	.5 lb. per b.h.p.-hour.
Consumption of oil .. .. .	.03 lb. per b.h.p.-hour.

2. Proposed Crossing Routes

Prevailing wind on the direct route (London to New York) is almost always from west to east, which would of course always favour the eastbound journey, but is unfavourable to the westbound journey. It is proposed, therefore, that the crossing eastward from New York to London should be made by the most direct route, and thus take advantage of the westerly winds; the distance direct by this route is 3,000 miles. By making the westbound journey by a southerly route, *via* the coast of Portugal—Azores—and on 35 deg. N. parallel of latitude across the Atlantic, and then to New York, the voyage is made in a region where the prevailing westerly winds of the higher latitudes are absent, and only light winds are encountered, which are generally of a favourable direction. The distance by this route, however, is about 3,600 miles, but with a ship speed of 60 m.p.h. it would be quicker to make the westbound journey by the direct route if the westerly wind did not exceed 10 m.p.h. If the wind was greater than this, it would be quicker to go West by the southerly route *via* Azores. For information regarding prevailing winds, reference should be made to Section V.

As a basis for the times taken, the journey from London to New York *via* Azores is taken. Although the speed of the airship at maximum power is 75 m.p.h., the crossing normally would be made at a speed of 60 m.p.h., which only requires 2,000 h.p., and is thus much more economical in fuel. The full speed, however, can be used whenever the ship has to voyage through any storm areas against strong head winds. By the southerly route, the time taken for the journey of 3,600 miles at a speed of 60 m.p.h. is 60 hours, but to allow for delays owing to adverse weather, allowance is made for the airship always carrying 80 hours' fuel at 60 m.p.h.

The distances and normal times for the journey would therefore be as follows:—

London to New York, *via* Portugal and the Azores, 3,600 miles
Time taken, 60 hours or 2½ days.

New York to London by the direct route, 3,000 miles.
Time taken, 50 hours or just over 2 days.

3. Service

It is proposed to have four airships for use on the cross-Atlantic service. Two airships would only be in service at a time, and the other two standing by, so that each airship could lay up alternate weeks for overhaul and refit, etc. At the time of journey between London and New York will vary between 50 to 60 hours, each airship will therefore easily make two crossings or one double journey per week, thus giving a service with two airships of two "sailings" each way per week. The average time table might therefore be as follows:—

LEAVE LONDON.	ARRIVE NEW YORK.
Monday, a.m.	Wednesday, p.m.
Thursday, a.m.	Saturday, p.m.
LEAVE NEW YORK.	ARRIVE LONDON.
Monday, p.m.	Thursday, a.m.
Thursday, p.m.	Sunday, a.m.

From available weather records, it is considered that crossings would be practicable on at least 300 days in the year, or 82 per cent. of the total days, so that it is probable that a total of 200 crossings in the year could be maintained. It is probable that until weather conditions have been further studied so that advantage can be taken of the best possible routes, that a regular service of two crossings each way per week could probably only be maintained at first in the months of May to September, and that the crossings in October to April would probably be irregular, the actual day of sailing being dependent on the weather conditions.

4. Crew Required

Two watches would be carried, who would take duty in 8-hour shifts, and both watches on duty when leaving or landing.

Each watch: Navigating officer, steersman, elevator man, four engineers, signalman for W/T, 8 men.

Also two stewards. Commanding officer.

Total crew	19 men.
Four crews would be in service between the airships, so that each crew would only make two crossings per week.	
Weight of crew at 160 lbs. per man	Total weight 190 lbs. per man.
Personal effects at 20 lbs. per man	
Food at 10 lbs. per man per crossing	
Total weight for crew .. 190 x 19 = 3,600 lbs. = 1.6 ton	

5. Passengers and Mails Carried

Weight per Passenger.	
Weight of man at 170 lbs.	} 235 lbs. per man.
Personal effects at 50 lbs. per man	
Food, etc., for journey at 15 lbs. per man	
Distribution of Disposable weight for Journey	
Crew and effects = 19 men at 190 lbs.	1.5 ton
Fuel and oil for 80 hours at 60 m.p.h.	38.0 "
Starting ballast for 2,000 ft.	6.5 "
Emergency ballast	5.0 "
Available for passengers and mails	15.0 "
	68.0 tons

15 tons would carry 140 passengers and effects, or 10 tons mails, and 50 passengers.

(To be continued.)

Memorial Service for Flying Officers and Men

A MEMORIAL service to commemorate the officers and men of the R.N.A.S., R.F.C. and R.A.F. who have fallen during the War will, with the permission of the Dean of Westminster, be held in Westminster Abbey at 12 noon on February 19. The King has been pleased to signify his intention to attend. Owing to the seating accommodation being limited, it has been necessary to restrict the tickets to relations and friends of fallen officers and men. It is particularly requested that no correspondence in connection with the service should be sent to the Abbey authorities. Applications for tickets are being dealt with at Room 119, Air Ministry, Strand, W.C. 2.

Civil Aerial Transport

THE lecture by Mr. Claude Grahame-White on "Civil Aerial Transport: Is it Practicable, is it Safe, and is it Profitable?" which was postponed owing to the General Election, has now been arranged for Wednesday, February 19, at the Central Hall, Westminster, at 8 p.m. Maj.-Gen. the Rt. Hon. J. E. B. Seely, C.B., C.M.G., D.S.O., Under-Secretary of State for the Air, will be in the chair. Tickets may be

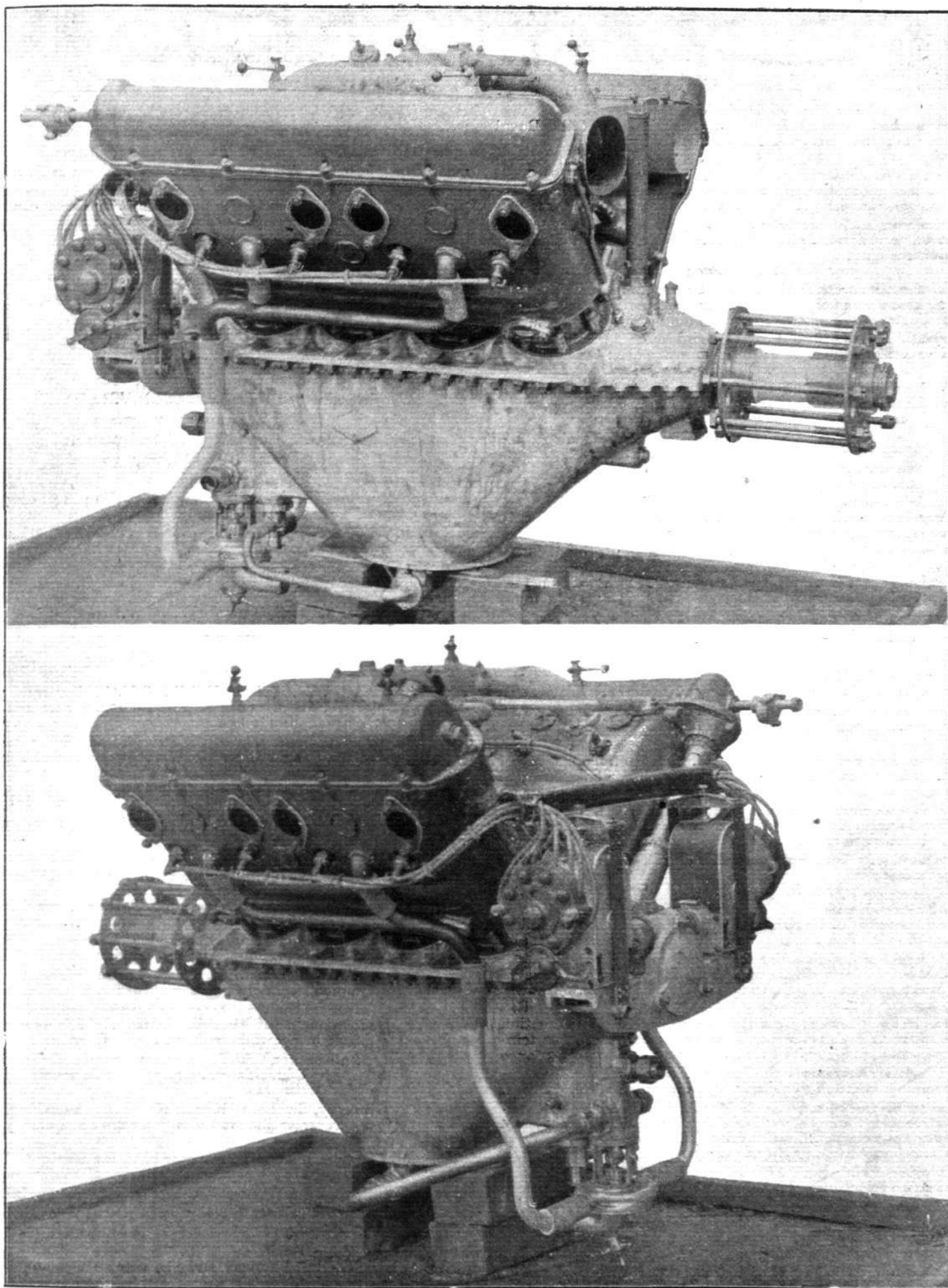
obtained from the Secretary of the Royal Aeronautical Society, 7, Albemarle Street, London, W. 1.

Folkestone Looks Twice at a Gotha

THE Folkestone Corporation is in something of a quandary. It would very much like to accept an offer made by the Royal Aeronautical Society, on behalf of the Air Ministry, of a complete Gotha, with engine, for permanent exhibition in the town. It was pointed out, however, that it would be necessary to keep the machine under cover, and that a building to accommodate it would cost £3,000 or more. Some members of the Council, considering the gift somewhat in the nature of a white elephant, wished courteously to decline it, but on second thoughts a small committee was appointed to consider the matter.

Flight "Milestones"

In answer to the rush of enquiries as to when the portfolio edition of the Flight "Milestones" Series will be published, due notice will be given in the pages of FLIGHT when the edition is ready. It is obvious that this cannot be until the series has been completed.



TWO VIEWS OF A WOLSELEY-BUILT HISPANO-SUIZA ENGINE.—A very great number of these engines have been built by the Wolseley firm during the War. The type is known as the Viper II (W.4A), and develops 210 h.p. at 2,000 r.p.m.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

ANNUAL GENERAL MEETING

The Annual General Meeting of the members of the Royal Aero Club of the United Kingdom will be held on Monday, March 31, 1919, at 3, Clifford Street, New Bond Street, London, W. 1, at 6 p.m.

Notices of motion for the Annual General Meeting must be received by the Secretary not less than 21 days before the meeting, and must be signed by at least five members. The last day for the receipt of notices of motion is Monday, March 10, 1919.

Committee

In accordance with the rules, the Committee shall consist of eighteen members. Members are elected to serve for two years, half the Committee retiring annually. Retiring members are eligible for re-election.

The retiring members of the Committee are:—

Lieut.-Col. John D. Dunville, R.A.F.
Lieut.-Col. Spenser D. A. Grey, D.S.O., R.A.F.
Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.
Lieut.-Col. A. M. Longmore, R.A.F.
Lieut.-Col. F. K. McClean.
Brig.-Gen. E. M. Maitland, D.S.O., R.A.F.
The Right Hon. Lord Northcliffe.
Lieut.-Col. Alec Ogilvie, R.A.F.
Maj.-Gen. Sir Godfrey M. Paine, K.C.B., M.V.O.

Any two members of the Club can nominate a member to serve on the Committee, provided the consent of the member has been previously obtained. The name of the member thus nominated, with the names of his proposer and seconder, must be sent in writing to the Secretary not less than fourteen days before the Annual General Meeting. The last day for the receipt of nominations is Monday, March 17, 1919.

THE FLYING SERVICES FUND

(Registered under the War Charities Act, 1916)

Administered by the Royal Aero Club

For the benefit of Officers, Non-Commissioned Officers and Men of the ROYAL AIR FORCE who are incapacitated on Active Service, and for the Widows and Dependents of those who are killed.

Honorary Treasurer:

The Right Hon. LORD KINNAIRD.

Committee:

Lieut.-Col. T. O'B. HUBBARD, M.C., R.A.F. (Chairman).
Mr. CHESTER FOX.
Lieut.-Col. HARCOURT G. GOLD, R.A.F.
Lieut.-Col. C. E. MAUDE, R.A.F.
Brig.-Genl. R. H. MORE, C.M.G., R.A.F.

Secretary:

Lieut.-Com. H. E. PERRIN, R.N.V.R.

Bankers:

Messrs. BARCLAYS BANK, LTD., 4, Pall Mall East, London, S.W. 1.

Subscriptions

	£	s.	d.
Total subscriptions received to Feb. 4th, 1919	14,814	0	7
French Class of No. 2 Aeroplane Supply Depot, Royal Air Force, France		11	11 9
Proceeds of a Dance held by Ap. D. (A.) Department of Aircraft Production, Ministry of Munitions, on January 10th, 1919		14	5 9
Total, February 11th, 1919	14,839	18	1

THE AIR COUNCIL

As we go to press the following official announcement with regard to the personnel of the Air Council is made. With this reconstitution of the offices, very great strength has been given to the future of aviation; the return of Gen. Trenchard as Chief of the Air Staff, and the appointment of Gen. Sykes to the Civil Aviation Chair, cannot help but give the greatest cause for congratulation. The official announcement is as follows:—

The following appointments have been submitted to the King by the Secretary of State for the Royal Air Force, with the consent of the Prime Minister, and have been approved by his Majesty:—

Maj.-Gen. Sir H. M. Trenchard, K.C.B., D.S.O., to be Chief of the Air Staff.

Maj.-Gen. Sir F. H. Sykes, K.C.B., C.M.G., to be Controller-General of Civil Aviation.

Maj.-Gen. E. L. Ellington, C.B., C.M.G., to be Director-General of Aircraft Production and Research.

In order to provide for the control of civil aviation it will be necessary to alter the constitution of the Air Council as established by the Air Constitution Act, 1917, and legislation to enable that alteration to be made and to provide temporarily for the control of civil aviation in general accordance with the recommendations of the Civil Aerial Transport Committee will shortly be introduced into Parliament. Pending the passing of that legislation, Maj.-Gen. Sir F. H. Sykes, K.C.B., C.M.G., will be responsible to the Secretary of State, after which he will join the Council.

It is proposed to constitute the Air Council as follows:—

President—The Right Hon. Winston S. Churchill, M.P., Secretary of State for the Royal Air Force.

Vice-President—Maj.-Gen. the Right Hon. J. E. B. Seely, C.B., C.M.G., D.S.O., M.P., who will act as the deputy of the Secretary of State.

Maj.-Gen. Sir H. M. Trenchard, K.C.B., D.S.O., Chief of the Air Staff.

Maj.-Gen. Sir F. H. Sykes, K.C.B., C.M.G., Controller-General of Civil Aviation. (The office of Controller-General of Civil Aviation will be civilian in character, and in order to fulfil this condition Maj.-Gen. Sir F. H. Sykes has consented to being placed on the retired list of the Royal Air Force.)

Maj.-Gen. E. L. Ellington, C.B., C.M.G., Director-General of Production and Research.

The Marquess of Londonderry, M.V.O., Finance member of the Council.

Sir John Hunter, K.B.E., Administrator of Works and Buildings, pending the settlement of War building contracts.

Sir Arthur Duckham, K.C.B., to be an additional member of the Air Council pending the redistribution between the Air Ministry and the Ministry of Munitions of the functions relating to aircraft design, supply and inspection.

Sir James Stevenson, Bart., Surveyor-General of Supply on the Army Council, to be an additional member of the Air Council for general business purposes, without control of any special department of the Air Ministry. Sir James Stevenson will remain a member of the Army Council.

Brig.-Gen. W. Alexander, C.M.G., D.S.O., to be an additional member of the Air Council representing the Ministry of Munitions.

Lord Londonderry, Sir John Hunter, Sir Arthur Duckham, and Sir James Stevenson will continue to serve in an honorary capacity.

The following additional appointments have been approved by the Secretary of State:—

Maj.-Gen. Sir Godfrey Paine, K.C.B., M.V.O., to be Inspector-General without a seat on the Air Council.

Brig.-Gen. R. M. Groves, C.B., D.S.O., A.F.C., to be Deputy Chief of the Air Staff.

Rear-Admiral Cecil F. Lambert, to be Director of Personnel.

A Canadian Air Board

FOR the purpose of administering the aeroplane plant at the aerodrome at Camp Borden and the large camp at Long Branch, both of which were taken over by the Government from the Imperial Munition Board, a Canadian Air

Board is in process of organisation, says the *Morning Post* correspondent at Montreal. It is also stated that Camp Borden, with a full equipment, including 50 aeroplanes, is to be used for the development of aerial science in the Dominion.

SOME INTERESTING STATISTICS

DURING the War one has been debarred from referring in detail to the construction and performances of British and Allied aircraft and their engines. Although these restrictions are now relaxed, if not actually removed, it is still a matter of considerable difficulty to obtain and to get permission to publish, many interesting and instructive data relating to aircraft. We ourselves have been among the first to take advantage of this relaxation by commencing publication of our "Milestones" series of articles giving particulars of weights, powers and performances of British aeroplanes and seaplanes. In America, however, not only are the restrictions entirely removed, but the American Government is actually giving every facility and assistance in the publication of data

relating to aircraft and aero engines. Thus it comes to pass that for the valuable tables on pages 201 to 207 of particulars of aero engines, French aeroplanes, and aeroplanes of British design built in America, reproduced by courtesy of our New York contemporary *Automobile Industries*, we are, apparently, indebted to the American Air Ministry. These tables appear to be officially compiled, and it may therefore be taken for granted that they are as accurate as it is possible to make them. Of particular interest will be found the tables of aero engines, since it would be a matter of great difficulty, without official aid, to collect all the necessary data. In the same way it has not been possible to obtain or publish detailed data relating to the performance of French aeroplanes, and

the two tables dealing with this subject should therefore be of considerable interest.

The table giving particulars of British aeroplanes is of interest inasmuch as it deals with some machines that have not as yet been included in our "Milestones" series, while in the case of other machines it affords a comparison between the original British aeroplane and its American version. Altogether we feel sure that our readers will appreciate the value of these tables, which will, we trust, be found useful not only on account of their immediate interest, but also, and perhaps even more so, on account of their utility for reference purposes.

FEBRUARY 13, 1919

COMPLETE TECHNICAL SPECIFICATIONS OF IMPORTANT AMERICAN AND FOREIGN AEROPLANE ENGINES

Engine.	Rated h.p.	Type.	No. of cyls.	Bore.		Stroke.		Bore and Stroke Ratio.	B.H.P. and R.P.M. Ground Level.				Com- pression Ratio.	Piston Speed, Ft./Min.	Order of Firing.	Method of Cooling.	M.B.P. lbs. per sq. in.	Valves per Cylinder.							
				Mm.	Ins.	Mm.	Ins.		Normal.		Maximum.							Inlet.				Exhaust.			
									B.H.P.	R.P.M.	B.H.P.	R.P.M.						No.	Dia.	Total Area.	Lift.	No.	Dia.	Total Area.	Lift.
Curtiss OX5	90	V-90°	8	101.5	4	127	5	1.25-1	93	1400	95	1450	4.5	1166	1L, 1R, 2L, 2R, 4L, 4R, 3L, 3R	W 111	ins.	sq. ins.	ins.	ins.	sq. ins.	ins.	ins.	sq. ins.	ins.
Curtiss VX	160	V-90°	8	127	5	177.8	7	1.41-1	206	1350	214	1450	4.71	1575	1L, 1R, 2L, 2R, 4L, 4R, 3L, 3R	W 110	1.19094	2.0623	3437	1.19094	2.3267	3878	1.19094	2.3267	3878
Liberty 8	270	V-45°	8	127	5	177.8	7	1.40-1	270	1700	285	1850	18%	1980	1L, 1R, 2L, 2R, 4L, 4R, 3L, 3R	W 115	1.2.5	3.2366	3740	1.2.5	3.2366	3740	1.2.5	3.2366	3740
Liberty 12A	400	V-45°	12	127	5	177.8	7	1.40-1	400	1700	430	1800	18%	1980	1L, 1R, 2L, 2R, 4L, 4R, 3L, 3R	W 115	1.2.5	3.4344	4375	1.2.5	3.4344	4375	1.2.5	3.4344	4375
Hispano-Suiza	150	V-90°	8	120	4.72	130	5.12	1.08-1	150	1450	170	1700	4.8-1	1240	1L, 6R, 5L, 2R, 3L, 4R, 6L, 1R, 2L, 5R, 4L, 3R	W 114	1.19685	2.4350	3937	1.19685	2.4350	3937	1.19685	2.4350	3937
Hispano-Suiza	180	V-90°	8	120	4.72	130	5.12	1.08-1	180	1700	205	1800	5.3-1	1450	1L, 4R, 2L, 3R, 4L, 1R, 3L, 2R	W 122	1.19685	2.9350	3937	1.19685	2.9350	3937	1.19685	2.9350	3937
Hispano-Suiza	300	V-90°	8	140	5.5	150	5.90	1.07-1	300	1600	340	1800	5.3-1	1578	1L, 4R, 2L, 3R, 4L, 1R, 3L, 2R	W 125	1.19685	2.9350	3937	1.19685	2.9350	3937	1.19685	2.9350	3937
Le Rhone	80	Rotary	9	106	4.13	140	5.51	1.32-1	80	1200	85	1300	1.33-1	1100	1, 3, 5, 7, 9, 2, 4, 6, 8	A 81	1.15629	1.7313	3593	1.15629	1.7313	3593	1.15629	1.7313	3593
Gnome	100	Rotary	9	110	4.33	150	5.90	1.36-1	103	1200	110	1300	4.0-1	1180	1, 3, 5, 7, 9, 2, 4, 6, 8	A 88.7	0	1.15629	1.7313	3593	0	1.15629	1.7313	3593	
ABC Wasp	170	Radial	7	114.3	4.5	150	5.9	1.31-1	170	1750	200	1850	4.025	1690	1, 3, 5, 7, 9, 2, 4, 6	A 115	1.2.17	3.33	4700	1.2.17	3.33	4700	1.2.17	3.33	4700
ABC Dragon-Fly	320	Radial	9	140	5.5	165	6.5	1.18-1	320	1650	350	1750	4.025	1785.5	1, 3, 5, 7, 9, 2, 4, 6, 8	A 114	1.2.6559	5.4537	6535	1.2.6559	5.4537	6535	1.2.6559	5.4537	6535
B.R. 1	150	Rotary	9	106	4.13	140	5.51	1.32-1	154	1250	156	1300	5.9-1	1394	1, 3, 5, 7, 9, 2, 4, 6, 8	A 94	1.1.77	2.41	4300	1.1.77	2.41	4300	1.1.77	2.41	4300
B.R. 2	200	Rotary	9	106	4.13	140	5.51	1.32-1	238	1300	242	1350	5.3-1	1475	1, 3, 5, 7, 9, 2, 4, 6, 8	A 95.2	1.2.47	3.9554	5100	1.2.47	3.9554	5100	1.2.47	3.9554	5100
Bardmore	160	Vert.	6	142	5.5	175	6.8	1.23-1	178	1350	192	1450	4.56-1	1435	1, 5, 3, 6, 2, 4	W 103	1.2.559	3.9554	5100	1.2.559	3.9554	5100	1.2.559	3.9554	5100
Galloway	240	Vert.	6	145	5.71	190	7.48	1.31	236	1400	250	1500	4.96-1	1558	1, 5, 3, 6, 2, 4	W 116	1.2.7165	4.0455	4724	1.2.7165	4.0455	4724	1.2.7165	4.0455	4724
Siddeley	240	Vert.	6	145	5.71	190	7.48	1.31	240	1400	250	1500	5-1	1558	1, 5, 3, 6, 2, 4	W 118.1	1.2.5984	3.9060	4724	1.2.5984	3.9060	4724	1.2.5984	3.9060	4724
Hispano	150	V-90°	8	120	4.72	130	5.12	1.08-1	156	1500	165	1600	4.8-1	1280	1, 4, 2, 3, 4, 1, 3, 2	W 114.75	1.19685	2.4350	3937	1.19685	2.4350	3937	1.19685	2.4350	3937
Hispano	180	V-90°	8	120	4.72	130	5.12	1.08-1	220	2000	225	2100	5.3-1	1707	1, 4, 2, 3, 4, 1, 3, 2	W 121.8	1.19685	2.4350	3937	1.19685	2.4350	3937	1.19685	2.4350	3937
Rolls-Royce Falcon 3	220	V-60°	12	120	4.00	130	5.75	1.44-1	270	2200	280	2300	5.3-1	2108	Rht. 1, 2, 5, 4, 3	W 114	1.1.7496	2.4211	4437	1.1.7496	2.4211	4437	1.1.7496	2.4211	4437
Rolls-Royce Eagle 8	360	V-60°	12	120	4.5	130	6.5	1.44-1	350	1800	360	1900	5.3-1	1950	Rht. 1, 2, 5, 4, 3	W 124	1.2.0000	2.9155	4850	1.2.0000	2.9155	4850	1.2.0000	2.9155	4850
Sunbeam Arab	200	V-90°	8	120	4.72	130	5.12	1.08-1	217	2000	224	2100	5.3-1	1710	1, 6, 5, 2, 3, 4, 6	W 115	1.2.126	2.3631	3543	1.2.126	2.3631	3543	1.2.126	2.3631	3543
Sunbeam Maori	250	V-60°	12	120	3.94	130	5.31	1.35-1	265	2100	280	2200	5.6-1	1710	1, 1A, 2, 2A, 4, 4A, 3, 3A	W 125	2.2.00	5.5180	4300	2.2.00	5.5180	4300	2.2.00	5.5180	4300
Sunbeam Cossack	320	V-60°	12	120	4.33	130	6.30	1.45-1	350	2000	364	2100	5-1	2100	1, 5, 3, 6, 2, 4	W 121	2.1.6142	3.6952	3543	2.1.6142	3.6952	3543	2.1.6142	3.6952	3543
Clerget 92	110	Rotary	9	120	4.72	130	6.30	1.33-1	122	1250	123	1300	4.36-1	1260	1, 3, 5, 7, 9, 2, 4, 6, 8	A 78	1.1.5748	1.9423	3937	1.1.5748	1.9423	3937	1.1.5748	1.9423	3937
Clerget 92	130	Rotary	9	120	4.72	130	6.30	1.33-1	127	1250	128	1300	4.56-1	1312	1, 3, 5, 7, 9, 2, 4, 6, 8	A 81	1.1.692	2.24	3900	1.1.692	2.24	3900	1.1.692	2.24	3900
Hispano*	180	V-90°	8	120	4.72	130	5.12	1.08-1	208	2000	225	2100	5.3-1	1707	1, 4, 2, 3, 4, 1, 3, 2	W 121.8	1.19685	2.4350	3900	1.19685	2.4350	3900	1.19685	2.4350	3900
Hispano*	200	V-90°	8	120	4.72	130	5.12	1.08-1	220	2000	225	2100	4.8-1	1707	1, 4, 2, 3, 4, 1, 3, 2	W 115	1.19685	2.4350	3900	1.19685	2.4350	3900	1.19685	2.4350	3900
Lorraine Dietrich	275	V-90°	8	120	4.72	175	6.89	1.46-1	278	1650	280	1700	4.8-1	1707	1, 4, 2, 3, 4, 1, 3, 2	W 115	1.19685	2.4350	3900	1.19685	2.4350	3900	1.19685	2.4350	3900
Fiat Arzbi	275-300	Vert.	6	160	6.3	180	7.08	1.12	304-290	1600	325	1760	4.31-1	1653	1, 5, 3, 6, 2, 4	W 105	2.2.00	5.5180	4300	2.2.00	5.5180	4300	2.2.00	5.5180	4300
Fiat Arzbi	600	Vert.	12	160	6.69	180	8.27	1.235-1	700	1500	725	1600	5-1	1600	1, 5, 3, 6, 2, 4	W 108	2.2.00	5.5180	4300	2.2.00	5.5180	4300	2.2.00	5.5180	4300
I.F. V5	200	Vert.	8	130	5.1	190	7.48	1.31	250	1400	268	1600	5	1995	1, 5, 3, 6, 2, 4	W 107.6	2.2.244	3.6952	3543	2.2.244	3.6952	3543	2.2.244	3.6952	3543
Spa 6A	200	Vert.	6	135	5.3	170	6.5	1.23-1	210	1600	225	1700	5	1895	1, 5, 3, 6, 2, 4	W 116.6	2.2.244	3.6952	3543	2.2.244	3.6952	3543	2.2.244	3.6952	3543
Benz	220	Vert.	6	145	5.7	190	7.48	1.31	230	1400	252	1650	4.93	1745	1, 5, 3, 6, 2, 4	W 113	2.2.244	3.6952	3543	2.2.244	3.6952	3543	2.2.244	3.6952	3543
Maybach	200	Vert.	6	150	5.9	190	7.48	1.31	200	1200	200	1300	4.8-4.52	1496	1, 5, 3, 6, 2, 4	W 107.4	2.2.244	3.6952	3543	2.2.244	3.6952	3543	2.2.244	3.6952	3543
Mercedes	160	Vert.	6	140	5.5	160	6.3	1.23-1	150	1250	150	1300	4.8-4.52	1312	1, 5, 3, 6, 2, 4	W 105.2	2.2.3622	3.6952	3543	2.2.3622	3.6952	3543	2.2.3622	3.6952	3543
Mercedes	260	Vert.	6	160	6.3	180	7.08	1.12	252	1400	260	1500	4.94	1635 at 1400	1, 5, 3, 6, 2, 4	W 107.5	2.2.3622	3.6952	3543	2.2.3622	3.6952	3543	2.2.3622	3.6952	3543
Oberursel	110	Vert.	6	140	5.5	160	6.3	1.23-1	110	1250	110	1300	4.8-1	1312	1, 5, 3, 6, 2, 4	W 107.5	2.2.3622	3.6952	3543	2.2.3622	3.6952	3543	2.2.3622	3.6952	3543

FURTHER DETAILS OF IMPORTANT AMERICAN AND FOREIGN AEROPLANE ENGINES.

Particulars of Accessories, etc.

Engine.	Carburettor.			Magneto.			Oil Pump.		Water Pump.		Air Pump.		Ratio of Gear Reduction.	Speed of Propeller.	Tractor or Pusher.	Overall Dimensions.				
	No.	Type.	Weight each.	No.	Type.	Speed x E.S.	Weight each.	No.	Type.	Weight.	No.	Type.				Weight.	No.	Type.	Weight.	Length.	Width.	Height.
Curtiss OX5	1	Zenith Duplex	4'2	1	Berling	2	21	1	Gear	..	1	Centrif.	..	..	Nil	E.S.	Either	mm.	mm.	mm.
Curtiss VX	2	Zenith Duplex	..	1	..	2	..	3	Gear	..	1	Centrif.	..	..	Nil	E.S.	..	1408	753	841
Liberty 8	1	Zenith Duplex	7	1	Twin Delco Generator, 8-volt	1'5	..	3	Gear	..	1	Centrif.	..	..	Nil	E.S.	Either	..	..	10
Liberty 12A	2	Zenith Duplex U.S.52	..	1	Twin Delco Generator, 8-volt	1'5	..	3	Gear	..	1	Centrif.	..	..	Nil	E.S.	Either	1755	..	1020
Hispano-Suiza	1	Zenith Duplex 48 D.C.	7'0	2	8-cyl. Dixie Transverse	2	..	1	Eccentric Vane type	..	1	Centrif.	..	..	Nil	E.S.	Either	1308	851	832
Hispano-Suiza	1	Zenith Duplex 58 D.C.	9'5	2	8-cyl. Dixie Transverse	2	..	1	Eccentric Vane type	..	1	Centrif.	..	..	Nil	E.S.	Either	1308	851	832
Hispano-Suiza	1	Zenith Duplex 58 D.C.	9'5	2	8-cyl. Dixie Transverse	2	..	1	Gear	..	1	Centrif.	..	..	Nil	E.S.	Either	..	..	..
Le Rhone	1	Mixing valve	4'19	1	A.D.S. 26° Early	9/4	9'10	1	Plunger	4'125	..	..	..	..	Nil	E.S.	Either	..	..	..
Gnome	1	Mixing Valve	..	1	..	9/4	..	1	Two Plunger..	..	..	..	..	..	Nil	E.S.	Either	..	..	..
ABC Wasp	2	A.B.C. Injectors	..	2	P.L. 7. M.L.P.	1'75	..	1	Gear	..	..	..	..	..	Nil	E.S.	T.	35'7"	42'20"	42'20"
ABC Dragon Fly	2	H.C.8	..	2	M.L.9	1'18	13'5	1	Plunger Distributed	..	..	..	..	..	Nil	E.S.	T.	1070	1232	1207
B.R.1	1	Block Tube	5	2	A.D.S. M.L.	2'25	10	1	Plunger	6'63	..	1	Plunger	4'7	Nil	E.S.	Either	43'5"	47'50"	41'57"
B.R.2	1	Block Tube	..	2	M.L.	..	10	1	Plunger	6'63	..	1	Plunger	..	Nil	E.S.	Either	..	..	..
Beardmore	2	Zenith	5'75	2	D.U.6 S.	1'5	16	1	..	..	1	Centrif.	4'9	..	Nil	E.S.	Either	57'08"	19'92"	31'88"
Galloway	2	48 Zenith RA	3'25	2	E.M.6	1'5	15	1	Rotary	4'06	1	Centrif.	6'51	1	Plunger	88	Nil	67'32"	20'07"	42'91"
Siddeley	2	Zenith	4'2	2	E.M.6	1'5	15	2	Gear	4'1	1	Centrif.	7'2	1	Plunger	7	Nil	69'88"	24'09"	43'62"
Hispano	1	Zenith Duplex 48 D.C.	7'0	2	1A8S	E.S.	17'75	1	Eccentric Vane	..	1	Centrif.	2'69	1	Plunger	15 oz.	Nil	51'53"	33'46"	32'67"
Hispano	1	Zenith Duplex 58 D.C.	9'5	2	1A8S. 1AB	E.S.	18'12	2	Eccentric Vane	..	1	Centrif.	2'69	..	Nil	E.S.	Either	47'24"	33'46"	33'34"
Rolls-Royce Falcon 3	2	R.R.C.H. 38M	..	2	Watford	1'5	14'25	1	Rotary	..	1	Centrif.	..	2	Plunger	2'75	59-1	72'04"	37'24"	42'00"
Rolls-Royce Eagle 8	2	R.R.C.H. Duplex 42 mm.	13'000	4	Watford	1'5	14'25	2	Gear	8'75	1	Centrif.	4'625	1	Plunger	2'875	6-1	75'98"	42'52"	48'03"
Sunbeam Arab	1	C.H.H.C. 7	..	2	B.T.H. A8S	E.S.	12'8	3	Gear	..	1	Centrif.	3	1	Plunger	45-27	1200	1105	810	903
Sunbeam Maori	4	C.H.B.Z.S. 42 mm.	..	4	W.B.G.	1'5	19'1	3	Gear	..	1	Centrif.	..	1	Plunger	2-1	1200	55'11"	35'46"	33'85"
Sunbeam Cossack	4	C.H.B.Z.S. 42 mm.	..	4	B6 or W.B.G	1'5	19'1	3	Gear	..	1	Centrif.	..	1	Plunger	2-1	1200	61'81"	37'79"	38'89"
Clerget 92	1	Block Tube Bush D.A.L.	4'41	2	A.D.S.	E.S.	9-10	1	Gear	6'63	..	..	..	1	Plunger	4'8	..	36'22"	40'15"	40'15"
Clerget 92	1	Block Tube	5'0	2	A.D.S.	2'25	9-10	1	Plunger	6'63	..	Nil	..	1	Plunger	4'7	Nil	36'22"	40'15"	40'15"
Hispano*	1	Zenith Duplex 58 D.C.	9'5	2	1ABS. 1AB	E.S.	18'12	2	Eccentric Vane	..	1	Centrif.	2'69	1	Plunger	15 oz.	Nil	47'24"	33'46"	33'34"
Hispano*	1	Zenith Duplex 58 D.C.	9'5	2	S.E.V.	E.S.	16-3	1	Eccentric Vane	..	1	Centrif.	..	1	Plunger	13 oz.	24 X 41 or 21 X 28	51'18"	33'46"	33'26"
Lorraine Dietrich	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fiat A12bis	1	Siemens	..	2	6-cyl. Dixie 60-V.	1'5	..	3	Gear	..	1	Centrif.	..	1	Plunger	..	Nil	..	..	..
Fiat A14	..	..	..	..	..	..	..	..	..	..	1	Centrif.	..	..	..	..	..	..	..	..
I.F. V5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Spa 6A	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1400	..	..	..	..
Benz	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1600	..	..	..	..
Maybach	2	Maybach	..	2	2H6 Bosch	..	..	1	Plunger	..	..	Centrif.	..	..	..	..	..	..	..	..
Mercedes	2	Maybach	..	2	2H6 Bosch	..	..	1	Plunger	..	..	Axial Turb.	..	..	..	..	..	..	..	..
Mercedes	2	Duplex	..	2	2H6 Bosch	..	..	2	Plunger	..	..	..	..	..	..	..	..	..	..	..
Mercedes	1	Mercedes	..	2	Bosch	..	..	..	Mercedes	..	..	Axial Turb.	..	..	..	..	..	..	..	..
Oberursel	..	..	..	..	4-Plunger	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

* French

PERFORMANCES OF IMPORTANT AMERICAN AND FOREIGN AEROPLANE ENGINES.

Details of Oil and Fuel Consumption, Weights, b.h.p., etc., of the 37 Engines of which specifications are given in the two preceding pages.

Engine.	Fuel and Oil Hr. Pnts.		Fuel and Oil Hr. Lbs.		Total Fuel and Oil per Hour.		Consumption per b.h.p. hour.						Weight of Engine Dry.		Weight of Engine in Running Order Less Fuel Oil and Tanks.		Weight of Engine with Fuel Oil and Tanks for 6 Hours Running.		Torque in lbs. ft.	Estimated b.h.p. at—				Estimated Fuel Consumptions Pints per Hour Ground Level Carburettor Adjust- ments, no Altitude Control.			
	Fuel.	Oil.	Fuel.	Oil.	Pts.	Lbs.	Pnts.		Lbs.		Combined.		Lbs.	Lbs./ b.h.p.	Lbs.	Lbs./ b.h.p.	Lbs.	Lbs./ b.h.p.		6,000 ft.	10,000 ft.	15,000 ft.	20,000 ft.	6,000 ft.	10,000 ft.	15,000 ft.	20,000 ft.
							Fuel.	Oil.	Fuel.	Oil.	Pts.	Lbs.															
Curtiss OX5	47	1.66	42.3	1.86	48.66	44.16	.51	.018	.46	.02	.528	.48	385	4.2	445	4.8	6765	7.3	371	76	67.3	57.5	49.4	42.6	40.1	37.1	34.4
Curtiss VX .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Liberty 8	168.8	13.44	132	12.2	182.24	182.2	.606	.0214	.547	.050	.627	.597	575	2.12	..	..	..	..	..	160	181	148	116	112	100	87	75
Liberty 12A	256	..	189	13.8	192.8	192.8	.563	.0199	.509	.037	.585	.546	845	2.11	1151.5	2.88	..	..	..	320	272	220	172	163	144	125	108
Hispano-Suiza .. ..	..	..	78	7.3	..	85.3	..	..	.52	.05	..	.57	440	2.93	..	..	..	..	..	..	..	..	..	..	..	..	..
Hispano-Suiza .. ..	..	..	114.8	..	..	127.2	..	..	.52	.056	..	.576	485	2.69	..	..	..	..	..	..	..	..	..	..	..	..	..
Hispano-Suiza .. ..	..	..	..	..	..	..	..	..	..	..	..	..	596	1.98	..	..	..	..	..	..	..	..	..	..	..	..	..
Le Rhone .. ..	..	..	..	..	..	..	..	..	.56	.19	..	.75	245	3.05	..	..	..	..	..	..	..	..	..	..	..	..	..
Gnome .. ..	..	..	..	..	..	..	..	..	.72	.18	..	.90	270	2.7	..	..	..	..	..	..	..	..	..	..	..	..	..
ABC Wasp	92	2.8	82	3	94.8	85	.55	.026	.495	.019	.567	.514	260	1.53	260	1.53	820	4.82	510	138.11	122.24	104.37	89.67	83.53	78.56	72.68	67.34
ABC Dragon-Fly ..	..	..	179	12.5	..	191.5	..	..	.56	.02	..	..	600	1.88	600	1.88	..	..	1019	256	218	176	138	149	134	116	100
B.R. 1	103.2	15	92.88	16.87	118.2	109.75	.661	.097	.59	.109	.738	.699	405	2.6	405	2.6	1129.35	7.8	655	129	114.2	97.5	83.7	93.7	88.1	81.5	75.5
B.R. 2	161	15.2	144.9	17.1	176.3	162	.7	.066	.63	.074	.766	.702	475	2	475	2	1344	6.3	961	196.8	174.2	148.75	127.8	146.2	137.5	127.2	117.8
Beardmore	103.2	5.3	93	5.96	108.5	98.96	.52	.032	..	..	.609	.552	592	3.3	713	4	1366	7.6	692	147.2	130.3	111.25	95.6	93.7	88.1	81.5	75.5
Galloway	136.8	6.4	123.25	7.2	143.2	130.45	.58	.027	.52	.03	.607	.55	690	2.95	843	3.57	1704	7.2	885	195.2	172.75	147.5	126.7	124.2	116.8	108	100.1
Siddeley	134.4	13.2	121	14.85	147.6	135.85	.56	.055	.50	.062	.615	.562	625	2.6	781	3.25	1677.6	7.0	900	198.5	175.7	150	129	122	114.7	106.2	98.4
Hispano	90.5	6	81.45	6.75	96.5	88.2	.58	.038	.52	.043	.618	.563	455	2.9	657.4	4.29	1239.5	7.9	546	129	114.2	97.5	83.8	82.2	77.3	71.5	66.25
Hispano	127	11	114.8	12.4	138.6	127.8	.58	.05	.52	.056	.63	.576	510	2.32	653	2.97	1492	6.67	583	182	161	137.5	118	115.8	109	100.8	93.5
Rolls-Royce Falcon 3 ..	154	7.15	138.6	8.84	161.15	146.6	.56	.026	.53	.026	.586	.559	723	2.68	912	3.38	1880	6.9	694	227.4	201.3	171.8	147.6	139.8	131.5	121.6	112.7
Rolls-Royce Eagle 8 ..	196	8.75	176.4	9.84	204.7	186.2	.56	.025	.5	.028	.585	.528	933	2.66	1177	3.37	2406	6.9	1020	289.5	256.2	218.75	188	178	167.4	154.8	143.5
Sunbeam Arab.	108.5	7.8	97.65	8.8	116.3	106.46	.50	.036	.45	.04	.536	.49	350	2.5	686	3.16	1389	6.4	570	179.5	158.8	135.6	116.5	98.5	92.6	85.7	79.4
Sunbeam Maori	150	6.2	135	6.97	161.2	141.97	.56	.023	.51	.026	.583	.539	890	3.3	1065	3.95	2002	7.8	662	219	194	165.6	142.3	136.2	128.1	118.5	109.8
Sunbeam Cossack	196	12	176.4	13.5	208	189.9	.56	.034	.50	.038	.594	.538	1218	3.2	1345	3.8	2598	7.4	919	289.5	256.2	218.75	188	178	167.4	154.8	143.5
Clerget 92	81.5	16	73.35	18	97.5	91.35	.667	.131	.6	.147	.798	.747	367	3	367	3	970	8	512	101	89.3	76.25	65.5	74	69.6	64.4	59.6
Clerget 92	85.2	13.85	76.68	15.38	99.05	92.26	.67	.109	.60	.123	.779	.723	400	3.15	400	3.15	1009	8	533	105	93	79.4	68.2	77.3	72.7	67.3	62.3
Hispano*	127	11	114.8	12.4	138.6	127.8	.58	.05	.52	.056	.63	.576	510	2.32	653	2.97	1492	6.67	583	182	161	137.5	118	115.8	109.0	100.8	93.5
Hispano*	124.8	13	112.3	14.62	137.8	126.9	.6	.06	.54	.067	.66	.607	503	2.42	638	3.1	1475.6	7.8	546	172	152.25	130	111.7	113.3	106.6	98.6	91.3
Lorraine Dietrich ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fiat A12bis	156	6.8	140	7.65	162.8	147.6	.55	.024	.49	.027	.574	.517	928	3.32	1110	3.96	2084	7.44	920	215	190.3	162.5	139.6	141.6	133.2	123.2	114.2
Fiat A14	367.4	29.3	330.7	33	396.7	363.7	.52	.042	.47	.047	.562	.517	1565	2.36	2020	2.9	4420	6.3	2450	512.4	430.75	370.6	306.2	313.7	290.25	268.9	268.9
I.F. V3 .. ..	..	..	..	..	..	..	..	..	..	..	..	..	825	3.95	..	..	..	..	..	..	..	..	..	..	..	..	..
Spa 6A .. ..	..	..	..	..	..	..	..	..	..	..	..	..	539	3.21	..	..	..	..	..	..	..	..	..	..	..	..	..
Benz .. ..	..	..	..	..	..	..	..	..	..	..	..	..	829	3.68	..	..	..	..	..	..	..	..	..	..	..	..	..
Maybach .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mercedes .. ..	..	..	..	..	..	..	..	..	.6	.029	..	..	618	3.86	..	..	..	..	..	..	..	..	..	..	..	..	..
Mercedes .. ..	..	..	..	..	..	..	..	..	.605	.032	..	..	935	3.75	..	..	..	..	..	..	..	..	..	..	..	..	..
Oberursel .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

* French.

FRENCH AEROPLANES IN SERVICE AT THE FRONT

Aeroplanes.		Engines.		Speed on the Level in m.p.h.				Duration of Climb.				Theoretical Ceiling, ft.	Hours of Flying under Full Power at Ground Level.	Armament.		Total Load, lb.	Division of Load.					Weight Empty, lb.	Total Weight in Flying Order, lb.	Load per h.p., lb.	Span, ft.	Length, ft.	Height, ft.	Total Surface, sq. ft.	Load per sq. ft., lb.
Make.	Type.	Make and Type.	Maximum Power Permitted.	At 6500 ft.	At 9800 ft.	At 13100 ft.	At 16400 ft.	To 6500 ft.	To 9800 ft.	To 13100 ft.	To 16400 ft.			Machine Guns with Mountings.	Bomb Carriers Provided for Dropping.		Fuel and Oil, lb.	Crew, lb.	Armament, lb.	Miscellaneous, lb.	Bombs, lb.								
Army Planes																													
A. R. (484 sq. ft.), radiator in the wing	A.R.L. 1A2	Renault 8Gdy	200	92	87	81	..	m. s.	m. s.	m. s.	m. s.	16400	2 30	Vick. front Turr. rear	4-264	936	308	352	165	110	..	1815	2750	13.75	39.4	28.74	9.85	484.5	5.72
A. R. (484 sq. ft.)	A.R.L. 2A2	Renault 8Gc	1600 190	1620 82	1590 79	1550 73.5	..	14 45	28 20	..	..	..	2 45	Vick. front Turr. rear	4-264	936	308	352	165	110	..	..	..	..	39.4	30.55	9.85	484.5	..
Breguet (560 sq. ft.), with ailerons	Bre. 14A2	Renault 12Fcx	1600 300	1580 109.5	1530 107	1490 104.5	100	6 50	11 35	18 30	29 30	..	2 45	Vick. front Turr. rear	4-264	1157	475	352	198	132	..	2222	3380	11.45	47.12	29.58	10.82	560	6.15
Breguet (528 sq. ft.)	Bre. 14A2	Renault 12Fcy	1600 310	1580 114	1560 108	1540 107.5	1510 102.5	7 40	12 10	17 35	25 40	..	2 45	Vick. front Turr. rear	4-264	1157	475	352	198	132	..	2222	3380	10.90	46.00	29.22	10.82	528	6.38
Breguet Fiat	Bre. 14A2	Fiat A12	1600 285	1000 110	1550 107.5	1520 103	1500 94	15 0	15 50	23 50	37 50	20300	3 0	Vick. front Turr. rear	4-264	1157	475	352	198	132	..	2288	3447	12.10	46.00	..	..	528	6.54
Caudron G6	Cau. 6A2	Rhone 9Jb	1600 130	1580 94	1570 91	1520 84.5	1470	7 35	13 40	24 55	..	15400	1 45	Supp. front Turr. rear	4-264	1100	383	352	169	196	..	2074	3170	12.20	55.7	28.22	9.68	427	7.42
Sopwith	Sop. 1A2	Clerget 9Bc or	1280 145	1310 104	1285 100	1205 93.5	..	12 45	23 40	41 20	..	..	2 15	Vick. front Turr. rear	4-264	880	264	352	169	94.5	..	1157	2040	15.07	33.6	25.60	10.16	344.5	5.93
Sopwith	Sop. 1A2	Rhone 9Jby	1300 135	1310 ..	1285 97	1230 ..	..	10 40	17 40	..	..	..	2 15	Vick. front Turr. rear	4-264	880	264	352	169	94.5	..	1157	2040	15.07	33.6	25.60	10.16	344.5	5.93
Salmson*	Sal. 2A2 and Sal. 2 bisA2	Salmson 9Z	1350 270	1300 116	1270 112.5	109 104	104	7 15	11 40	17 20	27 30	20300	2 45	Vick. front Turr. rear	4-264	1120	440	352	198	132	..	1676	2800	10.34	38.5	27.90	9.52	398	6.95
Spad 2-seater	Spa. 11A2	Hispano 8Bc	1600 235	1620 112.5	1590 110.5	1560 105	1520	7 35	12 30	17 30	..	20800	2 15	Vick. front Turr. rear	4-264	825	264	352	150	59	..	1485	2310	11.00	36.8	25.45	8.54	323	7.16
Spad 2-seater*	Spa. 16A2	Lorraine 8Bb	2150 250	2125 115	2095 ..	2050 ..	..	7 0	11 50	18 15	31 0	..	1 45	Vick. front Turr. rear	4-264	825	264	352	150	59	..	1526	2350	9.46	36.8	25.45	8.54	323	7.28
Caudron R11*	Cau. 11A3	Hispano 8Bda	1650 215	1650 114.5	1650 111.5	1600 108.5	1520 102.5	8 10	14 30	22 30	39 0	19350	3 0	Turr. front Turr. rear Emerg. gun	6-264	1684	792	528	231	132	..	3124	4760	11.00	58.9	36.80	9.18	583	8.18
Letord	Let. 1A3	Hispano 8A2	2150 175	2230 92	2115 88.5	2185 84	2080	12 0	21 30	36 0	..	17000	3 0	Turr. front Turr. rear Emerg. gun	6-264	1415	524	528	207	156	..	2758	4178	11.88	59.00	36.80	12.14	661	6.34
Letord	Let. 2A3	Hispano 8Bda	1700 215	1690 98	1655 96	1600 92	..	9 30	16 0	27 0	..	17700	3 0	Turr. front Turr. rear Emerg. gun	6-264	1685	792	528	220	143	..	3562	5200	11.88	59.00	36.80	12.14	661	7.46
Letord	Let. 5A3	Lorraine 8Ba	2150 250	2125 97.5	2075 94.5	2035 88	..	10 0	18 0	31 0	..	16050	3 0	Turr. front Turr. rear Emerg. gun	..	1730	835	528	220	143	..	3650	5380	10.78	59.02	36.70	12.14	680	7.87
Bombing Planes																													
Breguet*	Bre. 14B2	Renault 12Fcx	300	110	106.5	103	..	9 15	16 30	26 0	47 0	19000	2 45	Vick. front Turr. rear	32-253	1610	475	352	150	110	520	2280	3880	13.00	46.00	29.2	10.8	560	6.95
Caproni	Cap. Bn3	3 Isotta F	1600 180	1560 84	1530 81	1500 78	..	23 50	39 10	60 0	..	..	..	Turr. front Turr. above	8-440 4-264 2 G.P.	3300	1880	352	123	66	880	5420	8730	16.2	73.5	36.1	13.00	990	8.84
Sopwith	Sop. 1Br	Clerget 9Bb	1500 135	1530 ..	1500 ..	1460 ..	..	..	..	..	..	..	4 15	Supp. above	18-264 or 6-340 or 12-264 2-340	1100	470	176	99	22	332	1320	2200	16.3	33.7	25.6	10.2	345	6.34
Voisin L.A.P.	Voi. 8Bn2	Peugeot 8Aa	220	75	73	66	..	17 20	32 20	66 0	..	14100	4 0	2 Supp. lat.	10-264 4-340	1210	462	352	110	66	220	2900	4100	18.7	61.6	36.1	11.5	680	6.14
Voisin	Voi. 10Bn2	Renault 12Fcx	2050 300	2050 78	2040 76	2030 71.5	..	14 30	26 50	50 0	..	..	2 40	2 Supp. lat.	10-264 4-340	1210	462	352	110	66	220	2900	4100	18.7	61.6	36.1	11.5	680	6.14
Chasers																													
Morane	MoS A1C1	Gnome (stock)	160	129	126	121	..	4 55	8 05	12 20	..	23000	1 45	Vick. front	..	500	220	176	88	17.6	..	924	1425	..	27.9	18.55	7.90	145	10.2
Nieuport (160 sq. ft.)	Nie. 24.27C	Rhone 9Jb	1400 130	1385 106	1360 104.5	1330 103	..	5 40	9 25	14 40	21 30	22700	1 15	Vick. front	..	423	147	176	88	11	..	782	1200	9.25	26.9	21.00	7.90	160	7.47
Nieuport, 1/2 dihedral	Nie. 28C	Gnome 9N	1280 160	1280 123	1260 121.5	1240 119	115	5 30	9 0	14 0	21 15	22300	1 45	Vick. front	..	500	220	176	88	17.6	..	880	1380	..	26.3	20.5	7.55	172	8.10

Spad (195 sq. ft.)	Spa. 7Cr	Hispano 8Aa	175	119.5	111.5	108	6	40	11	30	19	30	18000	2	10	Vick. front	451	176	176	88	11	1100	1550	9.04	25.7	20	7.20	195	8.08			
Spad (195 sq. ft.)	Spa. 7Cr	Hispano 8Ab	1700	1720	1680	1640	4	40	8	10	12	40	21400	1	30	Vick. front	451	176	176	88	11	1100	1550	9.04	25.7	20	7.20	195	8.08			
			205	132	126	124.5	116																									
Spad* (2-machine gun)	Spa. 13Cr	Hispano 8Ba	1800	1870	1830	1780	5	17	8	45	13	5	20	0	22300	2	0	Vick. front	556	242	176	132	11	1255	1815	8.25	26.3	20.35	7.55	215	8.42	
			220	130	128	125	118																									
Spad* (2-machine gun)	Spa. 13Cr	Hispano 8BEc	2150	2180	2170	2130	4	40	8	0	12	20	18	35	22300	1	40	Vick. front	556	242	176	132	11	1255	1815	8.25	26.3	20.35	7.55	215	8.42	
			235	135	134	130.5	123																									
Spad Cannon*	Spa. 12Car	Hispano 8C	2150	2080	2060	2020	1950																									
			220																176	191	28.6											
Breguet Cannon	Bre. 5Ca2	Renault 12Fb	2150																													
			265	84	78.5			15	30				14100			1 1/2" cannon	1190	462	352	220	44	110	3087	4260	16.05	57.8	32.5	12.8	632	6.74		
Voisin Cannon	Voi. 8Ca2	Peugeot 8Aa	1400	1350	1350																											
			220	75	73	66		17	20	32	20	66	0		14100	2	45	Supp. above	2110	313	352	414	22	110	2890	4100	18.7	61.6	36.1	11.5	680	6.14
			2050	2050	2040	2030																										

* These types are the only extensively used and supplied to the squadrons. The other types are still figuring in some squadrons but are no more supplied.

FRENCH AEROPLANES UNDER TEST

Army Planes

			Army Planes																																			
Breguet	Bre. 14A2	..	Fiat A12	..	275	110.6	173	103.3	97	9	25	15	50	23	50	37	50	20350	3	0	Vick. front	14-44	1158	476	352	198	132	46	29.2	10.8	560	..
							1500	1580	1570	1520	1470																											
Breguet	Bre. 14A2	..	Lorraine 12D	..	370	122	118.7	115	107.6	5	20	8	50	13	0	19	20	23000	1158
							1650	1750	1730	1700	1650																											
Breguet	Bre. 14A2	..	Renault 12K	..	400	126.4	123	119.5	113.2	6	09	10	19	15	40	22	28	23000	3	40	Vick. front	..	1442	684	352	220	187	..	2640	4090	10.13	46	29.2	10.8	528	7.57
							1600	1595	1575	1560	1540																											
Salmson Armoured			Sal. 4Ab2	..	Salmson 9Zm	..	260	89.4	85	..	..	20	14	43	27	..	..	..	12140	2	0	Vick. front	..	1155	320	352	308	176	..	3100	4260	16.40	50	28.9	9.7	533	8.04
							1650	1690	1660	..	..																									

Bombing Planes

			Bombing Planes																													
Voisin Triplane/ab	Voi. 28Bn4	4 Hispano 8Be	215	79.6	..	..	..	27	0	..	..	..	11500	2	50	1.85-in. gun	As desired.	4400	1320	880	330	220	1650	11000	15400	17.95	118.5	78.0	18.9	2150	7.1	
Caudron C22	Cau. 22Bn2	2 Rhone 9Jb	2150 130	2150 98.3	88	*	..	11	0	21	0	*	..	11150	3	30	Machine gun rear	6-264 3-342	1980	550	352	88	66	837	2070	4050	15.65	54	27.2	8.25	536	7.57
Caudron C23	..	2CH 9Z	1280 260	1290 ..	1250 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1540	..	..	..	..	..	..	..	..	..
			2X 1650																													

* Speed with 1540-lb. climb with 1980 lbs.

Chasers

Gourdou	..	..	Cr ..	Hispano 8Ab	200	147.5	..	..	..	4	58	8	15	12	42	..	20500	1	30	2 Vick. front	†	430	160	176	172	17.6	†	1320	1750	8.8	29.5	21.6	7.54	179	9.82	
Nieuport	..	..	Nie. 2	Rhone 9R	1800	1980	123.8	121.3	117	4	30	7	40	12	0	..	20700	2	15	1 Vick. front	..	511	228	176	88	17.6	..	880	1390	7.38	26.3	20.2	7.54	172	8.08	
Nieuport Monocoque	..	..	..	Rhone 9R	1400	1410	1400	1380	1360	4	20	7	20	11	40	17	25	22000	2	15	1 Vick. front	..	516	234	176	88	17.6	..	..	..	..	..	..	..	..
Hanriot	..	..	HD. 1Cr	Rhone 9Jb	1400	1440	1430	1415	1385	5	31	9	17	14	08	20	50	23600	..	..	..	452	..	..	..	..	..	898	1360	10.4	27.6	19.5	8.10	192	7.06	
Morane Parasol	MoS A1Cr	Rhone 9R	1280	170	133.7	131.8	128	119.5	4	30	7	45	11	40	16	30	23000	2	10	1 Vick. front	..	511	234	176	88	17.6	..	916	1440	8.5	27.9	18.5	7.86	145	9.9*
Rep.	..	..	Cr ..	Salmson 9Z	1400	1405	1390	1365	1310	5	30	9	23	14	39	23	28	19700	2	0	2 Vick. front	..	683	313	176	176	17.6	..	1450	2130	7.7	27.6	20.8	8.24	221	9.52
Vickers	..	..	Vic. 16Cr	Lorraine 8Bd	1550	1705	1700	1670	1610	4	49	7	58	11	38	16	18	23800	2	10	2 Vick. front	..	738	368	176	176	17.6	..	..	..	..	..	..	..	..	..
Hanriot-Dupont	..	..	H.D. 3C2	Salmson 9Za	1700	1750	1730	1700	1700	6	39	11	04	17	09	25	34	22000	2	0	Vick. front Turr. rear	..	940	275	352	302	11	..	1564	2505	9.9	30.1	22.8	9.84	269	9.10
Vickers	..	..	C2	Lorraine 8Bd	1550	1640	1620	1590	1560	6	15	10	40	16	20	26	50	20350	2	15	Vick. front Turr. rear	..	967	386	352	198	11	..	1695	2640	9.25	35.45	26.2	8.70	356	7.47
Sea	..	..	Sea. 4C2	Lorraine 12D	1700	390	..	..	..	6	22	10	29	15	06	22	41	23000	2	0	Vick. front Turr. rear	..	1210	507	352	297	55	..	2180	3390	8.7	39.4	27.9	9.84	404	8.40
					1650																																

† The total load of the Gourdou plane has been reduced to take account of the lightening provided by the manufacturer from 512 to 428 lbs.

RECORD OF PERFORMANCES OF BRITISH AEROPLANES. (From information supplied by the U.S. Government.)

Type.	Tractor or Pusher.	No. of Seats.	Engine.	Normal b.h.p. and r.p.m. at G.L.	Lifting Surface.	Speed in m.p.h. and r.p.m. @ 10,000 ft.			Time in Mins. and Rate of Climb in ft. per minute and r.p.m. @ 10,000 ft.				Service Ceiling (Ft.).	Loading		Com- parative Performance. See Note.	Weight, lbs.					Dimensions.								
						At 6,500.	At 10,000.	At 15,000.	Time.	Rate.	Time.	Rate and r.p.m.		Time.	Rate.		Lbs. per Sq. Ft.	Lbs. per h.p.	Gross.	Empty.	Fuel and Oil.	Milky Load.	Crew.	Span.	Length.	Height.				
De Havilland 9 a	T	2	200 b.h.p. Siddeley	240@1400	438	..	..	102	9.7	550	17.1	405	34.2	200	17500	7.6	14.0	..	..	3351	2234	572	185	360	42	6	30	6	10	0
De Havilland 9 b	T	2	200 b.h.p. Siddeley	240@1400	438	..	111.5	101	10.1	520	17.9	380	36.4	180	17000	7.6	13.9	..	..	3342	2225	572	185	360	42	6	30	6	10	0
De Havilland 9 c	T	2	200 b.h.p. Siddeley	240@1400	438	..	..	97.5	11.1	460	20.3	315	46.7	110	15000	8.1	14.9	105.4	366	3564	2225	572	407	360	42	6	30	6	10	0
De Havilland 9 d	T	2	200 b.h.p. Siddeley	240@1400	438	..	107	..	11.7	430	21.7	290	..	..	14500	8.1	14.9	..	..	3564	2225	572	407	360	42	6	30	6	10	0
S.E. 5	T	1	Viper Hispano	202@1800	249	..	..	117.5	6.7	810	11.6	610	22.6	330	19000	8.0	9.8	..	..	1980	..	..	100	180	28	0	21	4	9	5
Bristol Fighter	T	2	200 His- pano S.	210@2000	405	..	105	97.5	8.7	620	15.1	475	28.8	270	19000	6.5	12.5	98.6	355	2630	1733	345	192	360	39	3	24	9	9	6
Blackburn Kangaroo	T	3	Twin Falcon Mk. 2	2x253@2000	868	98	1885/1895	..	18.2	250	38.2	115	..	..	10500	9.2	15.8	93.4	292	8017	5284	1730	463	540	74	10	42	6	16	0
Sopwith Hippo	T	2	225 Clerget	..	..	..	115	93	7.4	655	13.4	470	28.6	195	17000	..	..	..	..	2590	..	..	363	360	..	..	..	..	..	..
De Havilland 9	T	2	260 Fiat	260@1400	438	..	..	109	9.2	550	16.6	405	32.7	240	20000	8.2	13.9	..	..	3600	..	..	185	360	42	6	30	6	10	0
Sopwith Dol- phin e	T	1	200 His- pano S.	210@2000	258	..	127.5	119	6.1	900	10.5	705	19.5	425	21000	7.4	9.1	97.8	296	1911	..	..	101	180	32	6	22	6	8	0
Sopwith Dol- phin f	T	1	200 His- pano S.	210@2000	258	..	121.5	114	7.1	775	12.1	590	23.0	335	20000	7.6	9.3	..	..	1959	..	..	136	180	32	6	22	6	8	0
Sopwith Camel	T	1	150 Mono Gnome	154@1225	231	..	1915	..	5.6	960	9.6	755	17.9	470	22000	6.2	9.4	..	..	1441	930	230	101	180	28	2	18	6	8	6
De Havilland 4	T	2	Rolls Eagle 8	360@1800	438	..	130	124	6.5	840	11.3	660	20.9	400	21000	8.2	9.9	..	..	3576	2509	522	185	360	42	6	29	8	11	1
S.E. 5	T	1	Viper Hispano	202@1800	249	..	..	120	6.3	870	10.8	665	20.8	370	19500	8.0	9.8	..	..	1988	..	..	180	28	0	21	4	9	5	
Sopwith Dol- phin	T	1	200 His- pano S.	210@2000	258	..	128	119.5	6.4	855	11.0	675	20.2	420	21000	7.8	9.6	..	..	2003	..	..	101	180	32	6	22	6	8	0
Sopwith Dol- phin	T	1	200 His- pano S.	210@2000	258	..	1945	116.5	6.2	885	10.6	685	19.9	405	21000	7.7	9.5	..	..	1990	..	..	101	180	32	6	22	6	8	0
Sopwith Hippo	T	2	220 Clerget	..	360	..	115.5	101	7.4	655	13.4	470	28.6	195	17000	7.2	..	..	..	2590	1481	386	363	360	38	10	24	6	8	0
B. A. T.	T	1	100 Mono Gnome	105@1250	230	..	1345	..	9.1	550	16.8	360	43.0	85	14500	5.5	12.0	86.6	140	1260	866	164	50	180	24	8	20	8	7	5
Sopwith Snipe	T	1	200 B.R. 2	228@1300	274	..	1205	107	4.9	1040	8.8	760	17.6	400	19000	7.1	8.6	..	..	1950	..	..	321	180	..	..	..	..	..	..
De Havilland 9	T	2	260 Fiat	260@1400	438	..	117.5	107.5	9.0	580	16.0	430	32.3	215	17500	8.2	13.9	..	..	3600	2460	595	185	360	42	6	30	6	10	0
Sopwith Rhino	T	2	200 b.h.p. Siddeley	240@1400	(612)	..	1625	..	12.5	380	24.8	210	..	..	12000	5.9	15.0	..	..	3590	2185	507	538	360	41	0	30	3	10	0
Sopwith Rhino	T	2	200 b.h.p. Siddeley	240@1400	(612)	..	1490	..	13.5	350	26.8	185	..	..	12000	5.9	15.0	..	..	3590	2185	507	538	360	..	..	..	..	..	..
Sopwith Rhino	T	2	200 b.h.p. Siddeley	240@1400	(612)	..	1455	..	10.0	500	18.6	325	..	..	14500	5.0	12.8	..	..	3061	2185	465	51	360	..	..	..	..	..	..
De Havilland 6	T	2	200 b.h.p. Siddeley	240@1400	438	..	114	..	9.5	540	17.3	385	36.7	165	16500	..	..	..	..	..	..	..	185	360	42	6	30	6	10	0
De Havilland 9	T	2	200 b.h.p. Siddeley	240@1400	438	..	1570	..	11.0	465	20.2	305	49.5	85	14500	..	..	..	..	..	..	..	185	360	42	6	30	6	10	0
Sopwith Dol- phin h	T	1	200 His- pano S.	210@2000	258	..	1420	..	5.5	910	10.3	685	..	..	19000	7.6	9.4	..	..	1970	..	..	101	180	32	6	22	6	8	0
Sopwith Dol- phin i	T	1	200 His- pano S.	210@2000	258	..	2040	..	6.5	800	11.7	600	..	..	18500	7.8	9.6	..	..	2008	..	..	139	180	32	6	22	6	8	0
Sopwith Dol- phin j	T	1	200 His- pano S.	210@2000	258	..	1990	..	6.5	800	11.7	600	..	..	18500	7.8	9.7	..	..	2018	..	..	149	180	32	6	22	6	8	0
Sopwith Snipe	T	1	200 B.R. 2	228@1300	274	..	1990	110	4.9	1040	8.8	760	17.6	400	19500	7.2	8.6	87.9	180	1964	1212	251	321	180	30	0	18	7	9	0
Sopwith Snipe	T	1	200 B.R. 2	228@1300	274	..	..	114	4.4	1225	7.4	1000	13.3	710	..	..	..	..	..	..	..	..	70	180	30	0	18	7	9	0
Bristol Fighter	T	2	200 b.h.p. Siddeley	240@1400	405	..	104	99	7.7	710	13.5	550	25.2	320	20000	6.9	11.7	..	..	2810	1918	347	185	360	39	6	26	0	9	5
De Havilland 9	T	2	200 b.h.p. Siddeley	240@1400	438	..	1505	101	10.4	500	18.7	360	38.8	160	16500	7.6	13.8	..	..	3316	2201	570	185	360	42	6	30	6	10	0
							110																							
							1525					1365																		

NOTE.—Loading, lbs. per h.p.—Gross weight + actual h.p. developed at normal revs. (A suffix R shows that rated h.p. has been used in absence of actual h.p.)
 Lifting surface—Surface of wings and flaps only.
 Military load—Weight of guns, bombs, ammunition, and reconnaissance load.
 Air endurance—At 10,000' altitude at full throttle, including climb.

Service ceiling—Height at which rate of climb is 100 ft./min.
 Weight empty—Includes cooling water for water-cooled engines.
 a With reconnaissance load and gap covered with triplex.
 b With reconnaissance load, but with gap open.
 c With 14-20-lb. bombs and gap covered with fabric.

d With 14-20-lb. bombs, but with gap open.
 e Without cabane and Lewis gun.
 f With cabane and Lewis gun.
 g Two super-imposed two-bladed D.G.B. 2610.
 h With 2 Vickers guns only.
 i With 2 Vickers guns and Lewis gun on top plane.
 j With 2 Vickers guns and Lewis gun on cabane.
 Comparative performance reduced to correspond with loadings of 14 lbs. per h.p. and 7 lbs. per sq. ft.

THE CHRISTMAS STRUTLESS BIPLANE*

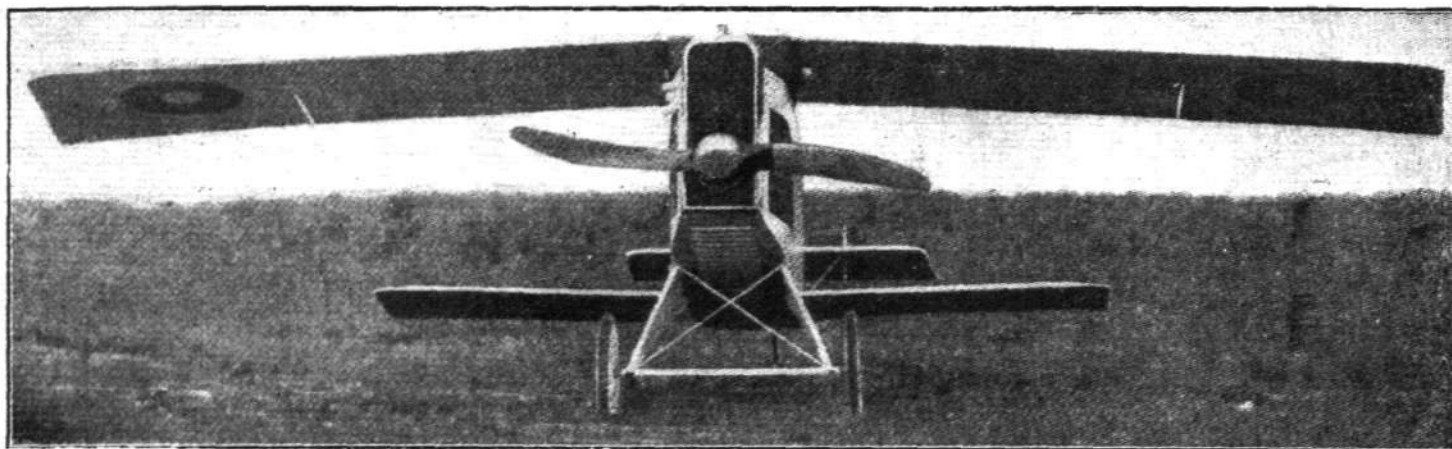
SEVERAL attempts have been made for years by experimenters to perfect an aeroplane with flexible wings, or following closely the flexibility of the wings of a bird. The biplane designed by Dr. W. W. Christmas appears to have met with much success in the structure mentioned, and his theories of flexing wings have shown more practicability than most rigid-wing adherents were apt to believe possible.

The British and French Governments have manifested considerable interest in this machine, probably because of reports of the great speed accredited to it.

by the resiliency of the wings. It would seem that such construction would result in a low factor of safety, but the designer claims a safety factor of seven throughout.

When at rest on the ground, the wing droops in a negative dihedral of -17 degrees. In flight the wing tips have a range of flexibility of 3 ft.; that is, the wings can assume positive or negative dihedral measuring 18 in. from the horizontal in either direction.

It has been demonstrated that the wings carry a load no greater than necessary to sustain the machine in flight, and



THE CHRISTMAS "BULLET."—Front view showing the absence of struts and bracing wires.

A most radical departure from what has heretofore been believed to be necessary practice is the entire elimination of struts, cables, and wires in the bracing of the wings, as well as the absence of wiring in the internal structure of the wings. The wing curve is one developed by Dr. Christmas, and is of fairly deep section between the main wing beams, but tapering off sharply aft of the rear beam, and merging into a flat thin, flexible trailing edge. The effect of the section is to maintain a high angle of incidence as the machine is traveling at low speed, and a low angle as the machine gathers speed, flattening out the wing and presenting very little resistance.

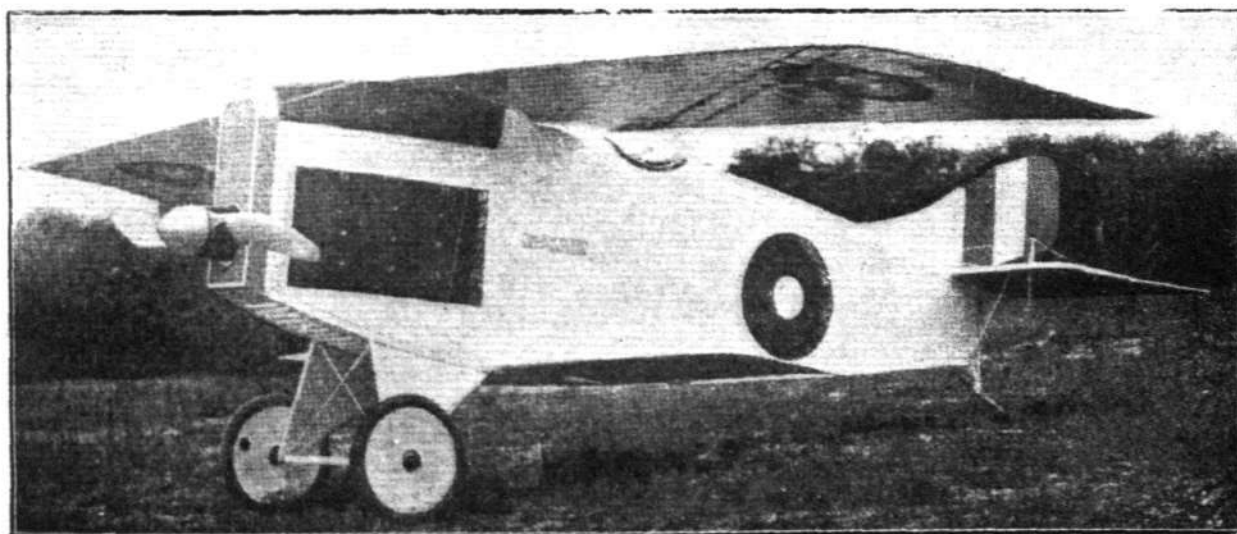
Upper and lower wings have the same aspect ratio. Upper wing has a thickness of 5 in. Patents are pending on the wing construction, and full details cannot now be given of these features.

With the wing section used, Dr. Christmas has succeeded

this load is carried regardless of wind puffs or extra strains due to increased wind pressure above or below the wing.

The principal specifications of the Christmas "Bullet" are as follows:—

Span, upper plane	28 ft.
Span, lower plane	12 ft.
Chord, upper plane	5 ft.
Chord, lower plane	2 ft. 6 in.
Area, upper plane	140 sq. ft.
Area, lower plane	30 sq. ft.
Length overall	21 ft.
Weight, machine empty	1,820 lbs.
Weight, fully loaded	2,100 lbs.
Minimum speed	50-60 m.p.h.
Maximum speed	175 m.p.h.
Cruising radius	550 miles
Ceiling	14,700 ft.



The Christmas "Bullet": Three-quarter view [from front.

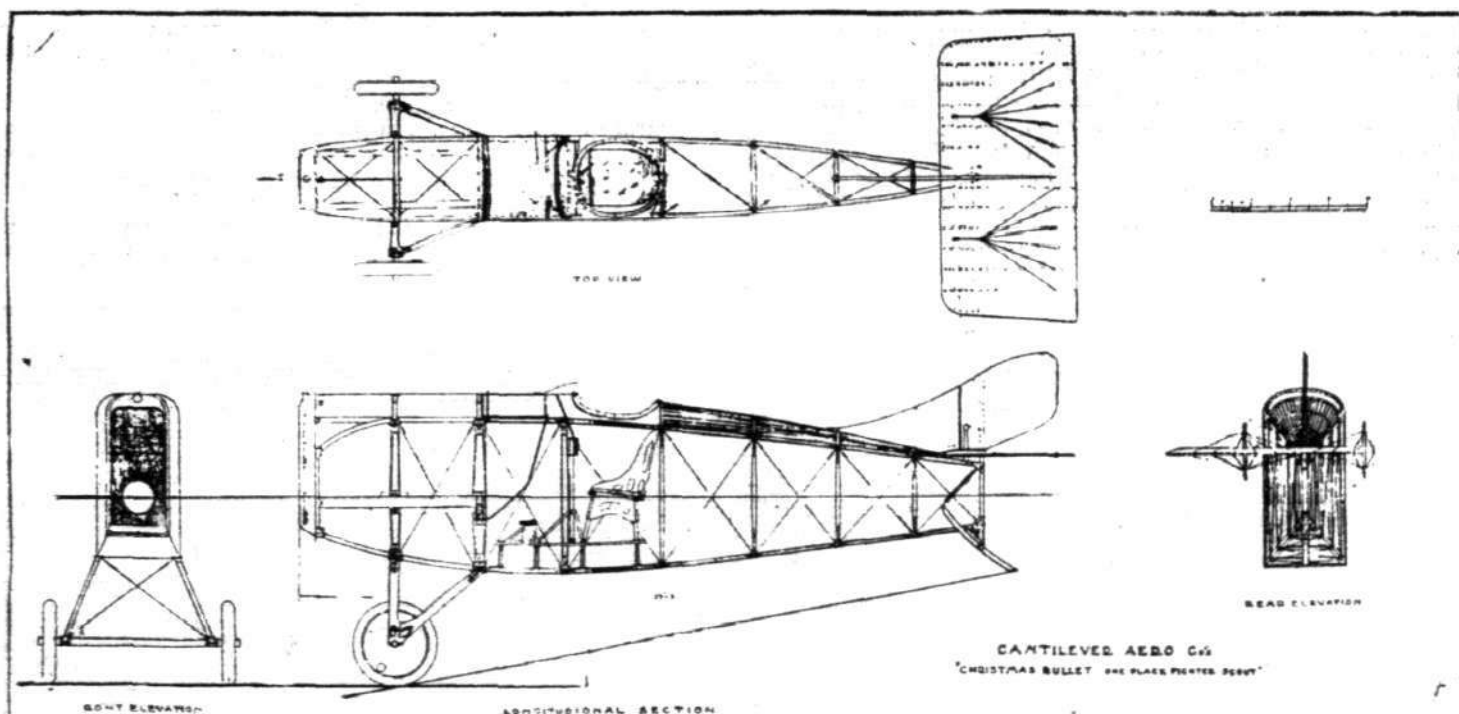
in obtaining a 72 per cent. lift on the upper surface, a higher vacuum than found on any other section. Wings are set at an incidence of $3\frac{1}{2}$ degrees.

As the wings are not braced transversely, flexibility is also obtained in that direction. Puffs of wind or sudden changes of direction, do not sharply affect the machine's progress, for the shock is transmitted only after being partially absorbed

A Liberty "6" is used, giving 185 h.p. at 1,400 r.p.m.; the machine attains 170 miles at three-quarter throttle. The weight fully loaded is with 50 gallons of gasoline and 5 gallons of oil, sufficient for a sustained flight of three hours.

The "Bullet" was originally designed as a single seater fighter. The pilot has an unobstructed range of vision, as his eyes are at the level of the upper plane and the lower plane has such a narrow chord that it offers but very little

* Courtesy Aerial Age, N.Y.



THE CHRISTMAS "BULLET."—Details of the fuselage and tail group.

obstruction to vision. Although military necessity does not now demand the adoption of the machine as a fighter, it lends itself admirably to the needs of civilian uses. The planes are readily detachable and are easily set up, as there are no wires to align. When the planes are removed, they can be strapped alongside of the fuselage and the machine then takes up only about one-fifth of the room ordinarily required for storage. The machine can be rigged up ready for flight in 15 minutes.

All the controls are exceptionally easy in their operation. The tail is flexible, and its efficiency is illustrated by the fact that a 1 in. deflection causes a controlling moment equal to that produced by a rigid flap movement of 4 in.

The two main tail beams are 1½ in. by 1¼ in. laminated

spruce. A horizontal V section spruce leading edge is used. The battens are air-seasoned white ash.

Ackerman spring wheels are used, which cut down resistance and do away with the usual rubber shock absorber cord.

The principle of radiation is original. Besides the nose radiator of the "Livingston" type, copper mesh screens cover in the sides and top of the fuselage, forward of the wings, and this surface has proven adequate for the Liberty "6." Much of the radiation is thereby effected by skin friction rather than by dead head resistance.

The propeller was designed by Mr. Caldwell at McCook Field, Dayton, Ohio. It has a 10 ft. 6 in. pitch and is 7 ft. in diameter, designed for a speed of 195 miles an hour, which the machine is expected to make with full power.

REPATRIATED

The following R.F.C. officers who were prisoners of war in Germany, have been released and have arrived in England. Where an officer was seconded, his original unit is indicated in brackets:—

Davies, Lieut. T. E. H. (K.R.R.C.).	King, Capt. D. B.
Edwards, Sec. Lieut. G. R.	MacTavish, Sec. Lieut. D. (Cam. Highrs.).
Gilbert, Sec. Lieut. R. S.	McDonald, Lieut. H. O.
Graham, Lieut. L. N. (W. Yorks.).	McPherson, Lieut. R. C. (Bl. Watch).
Jackson, Lieut. R. R. W. (R. Fus.).	Owen, Lieut. H. W.
James, Capt. C. E. H. M.C. (Welsh R.).	Rawson-Shaw, Capt. K. (R.F.A.).
Joyce, Lieut. W. (Bedf. R.).	

The following officers of the R.A.F. have been repatriated:—

King, Capt. D. B.	Patenaude, Lieut. J.
Marshall, Lieut. N. H.	Silk, Lieut. R. W.
O'Leary, Lieut. D. A.	Wedgwood, Lieut. F. C. B.
Owen, Lieut. H. W.	Whiteside, Capt. H. S.
Paine, Capt. L. P.	

Published January 30

Bridger, Sec. Lieut. H.	Mansell-Moullin, Lieut. O.
Broadbent, Lieut. G.	Murray, Lieut. D. C. G.
Cawley, Sec. Lieut. C. F.	Pugh, Sec. Lieut. J.
Cook, Sec. Lieut. L. C. L.	Radley, Lieut. J. E.
Foster, Capt. W. E.	Richardson, Capt. G. A.
Hall, Sec. Lieut. B.	Shackleton, Sec. Lieut. W.
Hartley, Sec. Lieut. H.	Sitch, Lieut. J. E.
Holland, Lieut. E. V.	Thomas, Sec. Lieut. H.
Hudson, Capt. A. R.	Vickers, Sec. Lieut. J. B.
Jeffkins, Sec. Lieut. E. C.	Wilson, Capt. C. B., M.C.
Macnamara, Sec. Lieut. J. F.	Wren, Sec. Lieut. H. L.
Macpherson, Sec. Lieut. J. M.	

Published January 31

Bennett, Lieut. R. C., D.F.C.	Doyle, Capt. J. E.
Bradford, Sec. Lieut. W. W.	Earle, Sec. Lieut. R. J.
Bradley, Lieut. D. E.	Hibbert, Sec. Lieut. J. R.
Brandrick, Sec. Lieut. A.	Hudson, Capt. F. N., M.C.
Briggs, Capt. H. R.	King, Sec. Lieut. P.
Brisbin, Lieut. H. V.	Kiteley, Lieut. A.
Brumell, Lieut. H. P.	McDonald, Sec. Lieut. J. C. J.
Calvert, Sec. Lieut. T. W.	Pratt, Sec. Lieut. A. R.
Clark, Lieut. H. J.	Russell, Lieut. H. W.
Dawson, Sec. Lieut. E.	Shipton, Sec. Lieut. G. A.
Dougan, Sec. Lieut. W. L.	Swann, Sec. Lieut. T. H.

Published February 1

Amory, Lieut. W.	Forrest, Lieut. L. H.
Anslow, Sec. Lieut. F. F.	Goffe, Sec. Lieut. W.
Awde, Lieut. I. W.	Haight, Lieut. J. L.
Ayrton, Capt. F. A.	Henty, Maj. E.
Castle, Lieut. G. L.	Hewat, Sec. Lieut. H. B.
Chase, Sec. Lieut. D. E.	Highwood, Capt. S. W., D.F.C.
Coward, Lieut. S. R.	Houlgrave, Sec. Lieut. C.
Crawford, Sec. Lieut. W. I.	Hubbard, Capt. W. R.
Crichton, Sec. Lieut. A. C.	Judkin, Sec. Lieut. O. V.
Croxall, Capt. E. R. T.	Knight, Lieut. C.
Culley, Capt. G. C. H.	McGreeth, Capt. J.
Culver, Sec. Lieut. D. E.	Mackereth, Capt. J.
Draisey, Lieut. A. S.	Main, Lieut. R.
Falkenburg, Lieut. G. D.	Matheson, Lieut. A. M.
Foggo, Lieut. N. O. M.	

Published February 1

Coomer, Sec. Lieut. F. H. V.	Searle, Sec. Lieut. R. J.
Dalzell, Capt. W. A. K.	Slipper, Lieut. R. A.
Gaze, Lieut. I. O.	Sparkes, Lieut. C. P.
Hancock, Sec. Lieut. C.	Stanley, Lieut. J. C.
Madge, Lieut. J. B. C.	Steele, Sec. Lieut. T. M.
Miles, Lieut. A. A.	Stevenson, Lieut. L. G.
Millard, Capt. B. A.	Taylor, Lieut. J. C.
Morris, Lieut. E. J.	Tennant, Sec. Lieut. P. S.
Norcross, Lieut. B.	Thresher, Sec. Lieut. C. E. W.
Norris, Sec. Lieut. E. J.	Touchstone, Lieut. G. R.
Parkes, Lieut. G. A. H., M.C.	Walker, Lieut. J. C.
Reveley, Lieut. P. T. A.	Walrond-Skinner, Capt. D. D.
Scharff, Sec. Lieut. R. L.	Wilcox, Sec. Lieut. C. H.

Published February 3

Bailey, Capt. F. J.	Ohrt, Lieut. F. M.
Chaloner, Capt. T. W. P. L.	Pym, Lieut. F. G.
Graham, Lieut. L. N.	Riley, Sec. Lieut. E. I.
Gray, Sec. Lieut. W. J.	Simons, Lieut. A. T.
Hankin, Capt. H. M.	Speagell, Sec. Lieut. H. M. D.
Heine, Lieut. R. W.	Sproule, Lieut. E. R. L.
Lansdale, Sec. Lieut. H.	Stead, Lieut. M. W. B.
McDonald, Lieut. H. O.	Sydie, Lieut. J. E.
McDonald, Lieut. J. J.	Thompson, Lieut. C. W. M.
Mills, Sec. Lieut. F. G.	Turner, Lieut. K. K.
Mulhall, Sec. Lieut. H. F.	Watts, Lieut. R.

AIRISMS FROM THE FOUR WINDS.

COUNCILLOR H. C. CHILD, Mayor of Ramsgate, is stated to have experienced 119 air raids and bombardments. Evidently a persistent hobby with Mr. Child.

A CHANCE for the real worker, including all middle-class voters, to organise against Bolshevism, and all the iniquities it means, offers by joining up with the anti-Bolshevik League—otherwise the Silver Badge Party—to the existence of which Lieut. E. Corse-Scott (late R.E.) draws attention. The address is 4, Spring Gardens, Charing Cross, and all British men and women are welcome as members. As Lieut. Corse-Scott points out, it is the great middle class that pays the penalty of its inaction against this treacherous menace, those responsible for the mischief usually being at present in a position to escape. Join the League now, suggests the Lieutenant, and do your bit towards beating Bolshevism.

In the same direction we are glad to note that on Friday afternoon of this week at 3 o'clock Brigadier-General Page Croft, M.P., will preside at a meeting at the Queen's Hall "to form a league to protect all law-abiding subjects and oppose Bolshevik methods, objects and effects." He will be supported by Mr. Havelock Wilson, M.P., Prebendary Gough, Mr. Leo Maxse, and Mr. William Boosey. The secretary of the National Party writes that "while the gathering is called by the National Party it is intended that it shall be entirely non-political, and those who join will be in no way committed to any party." Seats will be free, and tickets can be obtained from the organisers, 22, King Street, St. James's, S.W. 1.

LET all patriots join in promoting this great cleanser of the Bolshy pestilence, which may otherwise ultimately threaten the British Empire's existence.

SIR HAROLD ELVERSTON, at the London Institution, had a good deal to say the other day upon the morality and

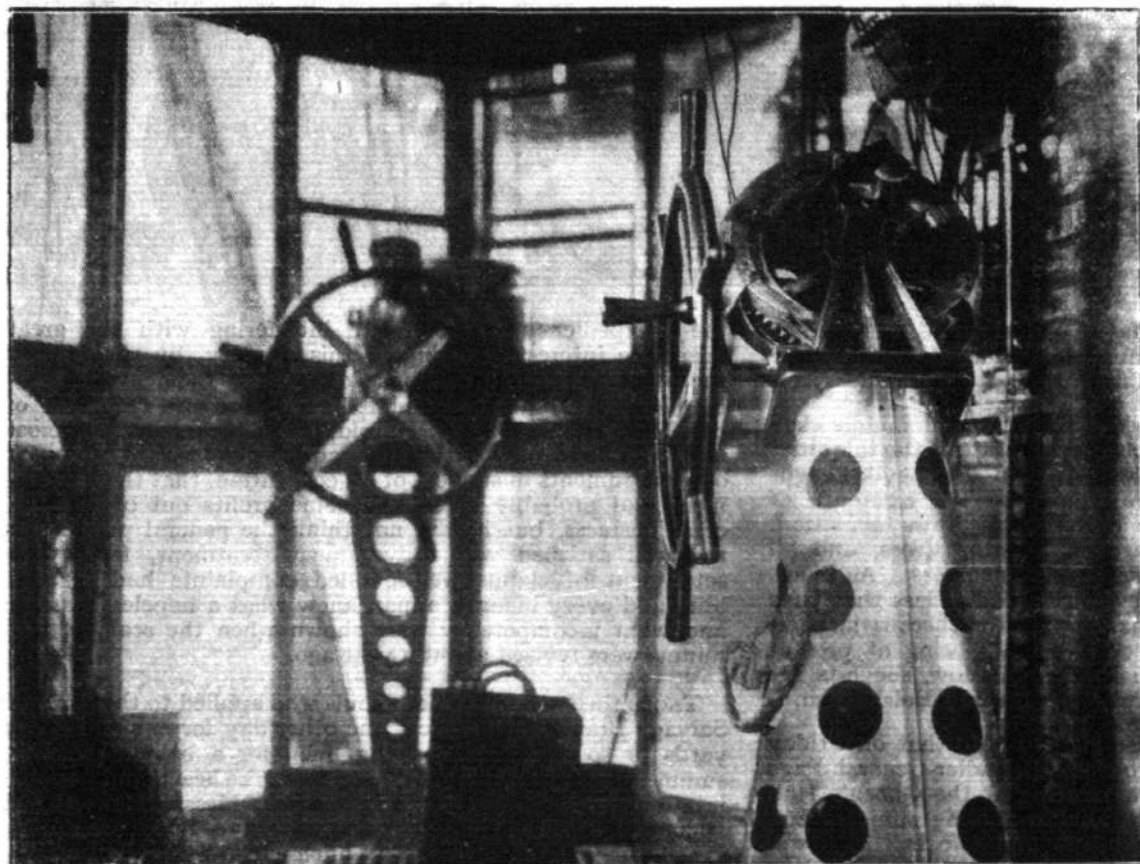
the inexpediency of the State interfering with the great insurance interests existing in this country, by shouldering the liabilities of the insurance offices and incidentally commandeering all the accumulated funds for the reduction of the National Debt. Sir Harold, after claiming that most folk were "fed up" with bureaucracy, put forward, amongst other arguments in support of his contention, that the Government had probably made handsome profits out of anti-aircraft business, but he did not think the general public was too well satisfied with Government treatment, for in the settlement of claims well-founded complaints had reached him, and every insurance man knew what a hopeless muddle and what incompetency were shown when the scale of premiums were revised about a year ago.

THOSE thrifty and cautious souls who applied to the Aircraft Salvage Branch Department the other day for one and a-half yards or so of aeroplane wing linen for a baby's pinafore, summer frock, and what not, may now take heart, and possibly in a modified form satisfy their desires. Messrs. Hewlett and Blondeau, Ltd., of Omnia Works, Leagrave, Beds., we notice, are offering similar Belfast flax linen surplus to their business requirements, and suitable for casement curtains, blouses, shirts, etc., in reasonably moderate lengths, in contrast to the A.S.B., which prefers indents of 1,500 yards or more from each purchaser. So those wishful to procure a few yards of this very high quality aeroplane linen should get in right away. The prices range from 3s. 5d. to 3s. 9d. per yard, according to width.

OFFICIAL confirmation of the success of the U.S. Air Mail Service, started last year, is now forthcoming under date January 18 last in the official "United States Bulletin" in the following terms:—"One of the most interesting events of the past year from a postal viewpoint was the establishment on May 15, 1918, of the Air Mail Service between



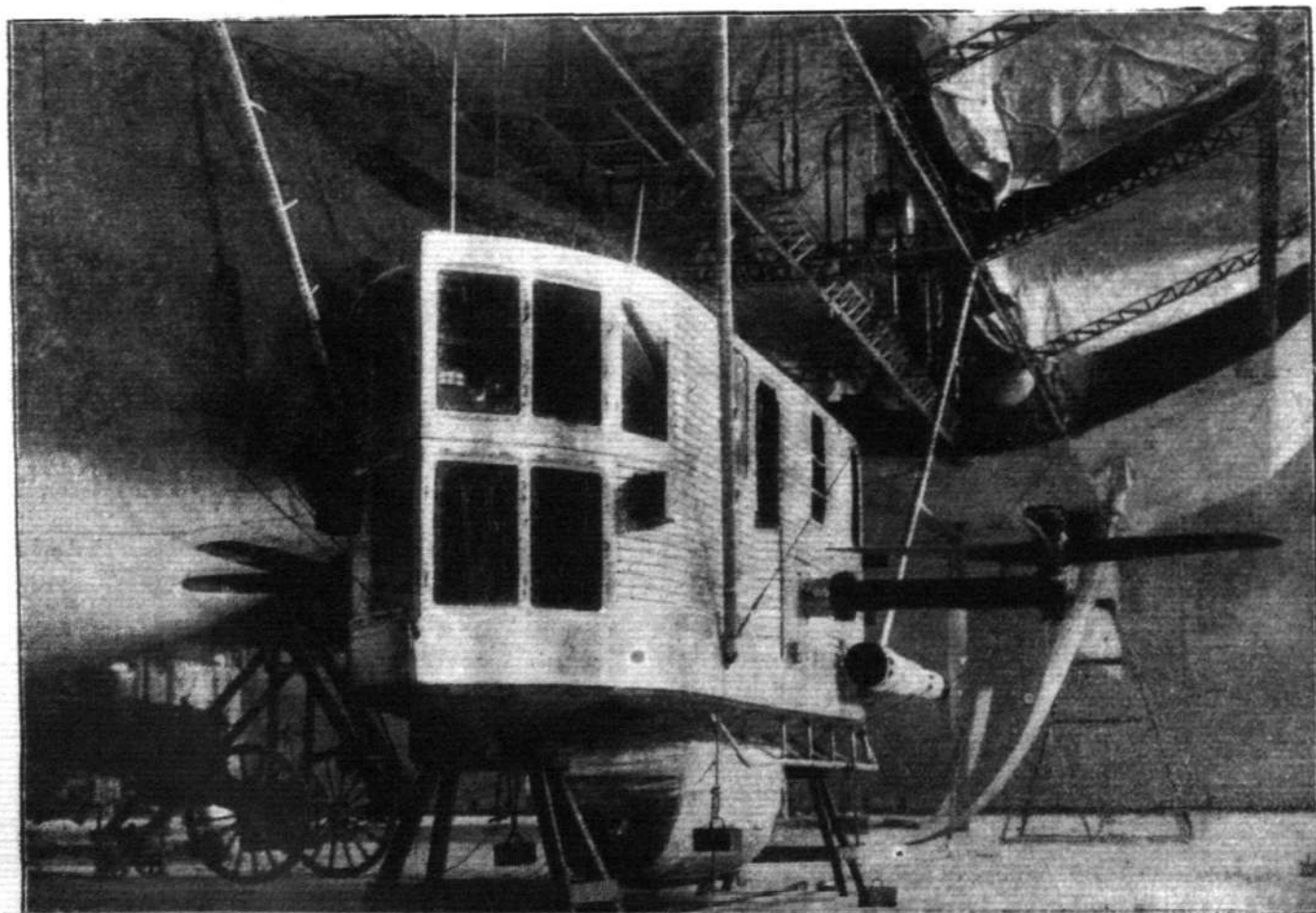
Presentation at Hendon Aerodrome on Tuesday last of 15 aeroplanes to the Canadian Military authorities.—General view of the presentation ceremony.



The British Air Fleet.—A view in the navigation cabin of rigid airship "R. 29."

Washington, D.C., and New York, N.Y. The wonderful success attending the operation of this new service indicates its entire practicability, and bespeaks for it a great future. It affords a most valuable opportunity for speeding up important mail matter. On the first trip there were 3,600 pieces despatched from the Washington office. At the installation of the service the rate of postage, which provided for special delivery service, was 24c. (about 1s.) per ounce, but on July 15, 1918, this rate was reduced to 6c. (3d.) per ounce, with 10c. (5d.) additional for special delivery service."

LIEUT.-COL. PAUL LECLERC has been charged with the organisation of the new aeroplane service by which the devastated regions in the north of France are to be re-victualled. Several squadrons of military machines have been put at his disposal, in order that supplies—and particularly condensed milk for the children—may be hurried to the stricken country. It is estimated that something in the neighbourhood of 150 landing grounds will be required, outside of those already in existence, to say nothing of the signal, telephonic, meteorological and radio-telegraphic services which will have to be instituted.



THE BRITISH AIR FLEET.—The aft engine-house of one of our British rigid airships, "R. 29," showing the reversible propeller system for lifting.

THIS is but incidental to the ravages of the War. Beyond this work of Col. Leclerc, he has been appointed to establish in French territory a scheme for future aerial communications. In an interesting interview published by the *Excelsior*, the Colonel lays it down that to achieve success it is necessary to have strongly-built machines, capable of flying long distances, without stopping, in all weathers, by day and night. We possess such machines, Col. Leclerc says, the one I prefer being a large biplane equipped with four motors, and of 800 h.p. as a minimum, giving a speed of about 112 miles an hour, carrying a load of 13 cwt. to 15 cwt., with a minimum of accidents. Officers will be appointed to select suitable landing-places in close proximity to the large towns of France, clear them of obstructions, build hangars, repairing workshops and huts, provide petrol, oil and provisions, the requisite staff for this kind of station, and a service of motor-buses to convey passengers from the town to the aerodrome. The stations will be made visible by means of large coloured boards by day and by coloured flares at night.

THE first lines to be opened will be one from London to

Marseilles, via Calais, Paris, Dijon and Lyons, which might be continued to Corsica and Tunis; then a line from Brussels to Paris, Clermont-Ferrand, Montpellier, Barcelona, with a possible extension to Carthage and Algeria. Another from Paris to Tours, Bordeaux, Bayonne and Madrid, thence to Morocco. Finally cross lines will be established from Brest to Strasbourg and Bohemia, from Nantes to Dijon and Italy, from Bordeaux to Lyons, and from Bordeaux to Nice, and from Nice to Geneva, Strasbourg, Metz, Mézières, Lille and Calais.

COL. LECLERC anticipates that there will be main aerial stations at intervals of 200 or 300 kilometres, with secondary or intermediary stations. The aeroplanes will carry passengers who for business reasons are obliged to travel quickly, as well as tourists, letters, and commercial goods. The lines thus created will afterwards be converted into aerial navigation companies, which will work them and fix the tariff. Col. Leclerc is convinced that before long an aerial journey by these lines will cost no more than the present railway fare for the same distance.

PASSENGER AND

THE Filey Council has deferred consideration of applications by the Blackburn Aeroplane Company and the Gloucester Aircraft Company to organise short flights from the beach next summer. The latter firm desired to use four seaplanes.

SEVERAL proposals for running passenger services are being considered by the Wallasey Council. The Quality Motor Services proposes to use a number of machines to carry four passengers, or two cwt. of luggage, and hopes to be ready by Whitsun to give half-hour trips around Wirral, departing from and landing on the shore at New Brighton.

PERMISSION has been given by the Bath City Council for a week's flying fair to be held in the town. The Mayor has also received a letter from a firm who are seeking a suitable aerodrome for use in connection with an aerial service between Bath and London.

THE Aircraft Transport and Travel Company are making arrangements for a service between Harrogate and London, and another concern is making enquiries to the same end. A twin-engined Handley-Page recently made a trial trip from London to Harrogate in 2½ hours. The Southern Stray will be used as a landing station temporarily.

IT is stated that the Great Northern Aerial Co., with a capital of £1,000,000, is to be formed to run coastal and cross-Channel services by seaplane and flying-boat between popular health resorts within a 100-mile radius of the Isle of Man.

THE Blackburn Co., which took visitors and residents on trips to Scarborough and Bridlington in pre-War days, is also arranging for a passenger service to the east and north-east coasts.

POSTAL SERVICES

THREE companies have approached the Blackpool Corporation with the object of organising aerial trips from Blackpool during the summer.

THE Leeds Corporation is stated to have received an offer from Gen. Sir David Henderson proposing to organise flights from the city at 12s. 6d. per trip. Another scheme is also in hand for a regular service between Leeds and London.

THE Dover Corporation is approaching the Naval authorities to ascertain whether one of their hangars on the sea front is likely to be available for use in connection with seaplanes for pleasure trips.

IT is announced that a company called the Swedish Air Traffic Co., with a capital of over £55,000, has been formed in Sweden to establish air traffic in Sweden, and between Sweden and foreign countries.

ACCORDING to the *Aftontidningen*, there is a German scheme on foot to control air traffic in Scandinavia from Warremünde. It would use machines built by the Friedrichshafen factories.

A FINE letter-carrying feat was carried out by the Royal Air Force on Saturday. The Air Ministry received a document at 12.35 p.m., at 1 p.m. a special aeroplane left Hendon, and the letter was delivered by the airman in Cologne before dusk. The 300 miles was flown with one stop near the French coast.

TWO Caudrons, one with ten passengers and the other with three, flew from Villacoublay to Paris on February 10. The smaller machine returned to Paris in the afternoon.



"Flight" Copyright

At an R.A.F. "Quadrille Party." A group, including Lieut.-Col. W. D. Pryce, R.A.F. (second from left, standing), and officers of No. 5 Stores Depot and Technical Printing Section, R.A.F., during the evening, in the Empress Hall, Earl's Court Exhibition, on February 5. Over 2,000 invitations were sent out, and by the appearance of this successful gathering it might well be they all accepted, and brought along a friend with them as well.



Seven of the Pilots sitting on some of the " goods " in connection with the Britain Belgium Aerial Goods Service



THE BRITAIN BELGIUM AERIAL GOODS SERVICE.—Conveying Woollen and Cotton Goods and Foodstuffs to our Ally's country, at the request of the Belgian Government. This service has been undertaken by Aircraft Transport and Travel, Ltd.—one of Mr. Holt Thomas' very live companies—with the approval of the Government. A squadron of service D.H. machines with R.A.F. pilots left Hawkinge aerodrome for the Belgian aerodrome outside Ghent, carrying nearly two tons of goods, urgently needed by the Belgian people, but obtainable only at prohibitive prices. It is intended that these first Aerial Goods Services, conducted at an average speed of 100 miles an hour, shall be extended to Antwerp and Brussels as well as Ghent. Our photograph shows the machines ready to start. The aeroplane nearest the camera is seen loaded with stores.

HONOURS

It was announced in a supplement to the *London Gazette* on February 8 that the King has been graciously pleased to confer the undermentioned rewards on officers and other ranks of the R.A.F. in recognition of gallantry in flying operations against the enemy:—

Awarded a Bar to the Distinguished Service Order

Lieut.-Col. Peregrine Forbes Morant Fellowes, D.S.O. (Sea Patrol, Flanders).—On May 28, 1918, Lieut.-Col. Fellowes, Commanding 61st Wing, undertook the task of attacking the lock gate at Zeebrugge, the damaging of which was at that time of great importance. He flew a DH-4 and by very skilful airmanship he succeeded in dropping a 230-lb. bomb from a height of only 200 ft. right on the lock gate in question. It has since been ascertained that the effect was considerable, and involved much dislocation of the enemy's plans for many days. (D.S.O. gazetted January 1, 1918.)

Awarded the Distinguished Service Order

Capt. (A./Maj.) Charles John Wharton Darwin. (France).—This officer has proved himself an exceptionally skilful and gallant patrol leader, conspicuous for utter fearlessness and disregard of danger. On a recent occasion, in company with one other machine, he attacked a formation of 14 Fokker biplanes, one of which was shot down and crashed. He has accounted for three hostile aircraft.

Sec. Lieut. (A./Capt.) Harry King Goode, D.F.C. (Italy).—During the recent operations this officer has displayed magnificent courage and determination in attacking enemy aerodromes, kite balloons and retreating columns, inflicting very heavy loss. On October 29 he led two other machines in a bombing raid against an enemy aerodrome; he completely destroyed with a bomb one hostile machine on the ground, and, attacking the hangars and workshops with machine-gun fire, he caused many casualties amongst the mechanics. Later on in the same day he returned alone to attack the same aerodrome, and found the enemy about to evacuate it. Flying at a very low altitude—at times his wheels almost touched the ground—he destroyed one machine with a bomb and set fire to another with machine-gun fire. The enemy personnel were driven back into the village by the vigour of his attack. Capt. Goode's utter disregard of personal danger inspired all who served with him. (D.F.C. gazetted December 3, 1918.)

Capt. (A./Maj.) Tom Falcon Hazell, M.C., D.F.C. (France).—A brilliant fighter, distinguished for his bold determination and rare courage, he has accounted for 29 enemy machines, 20 being destroyed and nine driven down out of control; he has also destroyed 10 balloons. On September 4 he rendered exceptionally valuable service in leading his flight to attack hostile balloons that were making a certain road impassable. Within an hour three of these balloons were destroyed, Maj. Hazell accounting for two. (M.C. gazetted July 26, 1917; D.F.C. gazetted November 2, 1918; Bar to D.F.C. same date.)

Lieut. Robert Baillie Lovemore. (France).—On October 28 this officer, attacked by two Fokkers, was driven down and compelled to land on marshy ground the enemy side of a river. Having extricated himself from his machine, he saw another of our machines land a short distance away, the pilot being thrown out; proceeding to the spot, Lieut. Lovemore found the pilot insensible, his head and shoulders under water, and the fuselage over his legs. Releasing him from the fuselage, he dragged him out of the water, and in a few minutes the pilot recovered his senses. Lieut. Lovemore then proceeded towards the river, and seeing a corporal of ours on the other side he directed him to go and get help, he himself returning to the pilot, whom he carried to the river bank. On arriving there he saw an infantry officer on the opposite bank, who swam across to join him, and between them they carried the pilot down to the river and swam across, holding him up. The enemy by this time had brought up machine guns, so that they were under fire when swimming across; they, however, got across in safety, and, a stretcher party arriving, the pilot was carried back to our lines. The cool courage and disregard of danger displayed by Lieut. Lovemore is deserving of very high praise.

Maj. Wilfred Ashton McCloughry, M.C., D.F.C. (Australian F.C.) (France).—The record of this officer's squadron, when equipped with Sopwith Camels, was unique, not only in the number of aircraft destroyed with almost insignificant loss to ourselves, but also in the persistence with which they carried out innumerable raids at the lowest altitude. The high morale and individual enterprise of the members of this squadron must be largely attributed to the personality and influence of their leader, Maj. McCloughry. When the squadron was re-armed with Sopwith Snipes the change in type necessitated a complete reversal of their aerial experience. By his careful and untiring leadership he succeeded in so training his squadron that in a series of raids on three successive days they accounted for upwards of 30 hostile aeroplanes. (M.C. gazetted July 18, 1917; D.F.C. gazetted November 2, 1918.)

Lieut. (A./Capt.) Donald Roderick MacLaren, M.C., D.F.C. (France).—Bold in attack and skilful in manoeuvre, Capt. MacLaren is conspicuous for his success in aerial combats. On September 24 he and his patrol of three machines attacked a formation of six enemy scouts, although the latter were protected by 16 other enemy aircraft at a higher altitude. Firing a burst at point-blank range, this officer shot down one in flames. In all he has accounted for 48 enemy machines and six kite balloons. (M.C. gazetted June 22, 1918; Bar to M.C. September 16, 1918; D.F.C. gazetted September 27, 1918.)

Maj. Michael Henry Braddon Nethersole. (France).—A squadron commander of exceptional merit, who, by his enthusiasm and fine example has revolutionised the tactics of his squadron. Formerly accustomed to bombing from a high altitude the members have descended to low altitudes, thus ensuring greater accuracy of aim. On October 30 he led his squadron on a low bombing raid against an aerodrome. The raid was most successful, he himself destroying two hangars. On the return journey he kept his machines so well together that, though they were attacked by large numbers of hostile scouts, they succeeded in destroying five of them with no loss on our side. The engagement continued during the whole of the return journey, but the squadron succeeded in causing considerable damage to hostile troops on the ground in addition to the casualties in the air as noted above.

Lieut.-Col. Louis Arbon Strange, M.C., D.F.C. (France).—For his exceptional services in organising his wing and his brilliant leadership on low bombing raids this officer was awarded the Distinguished Flying Cross not long ago. Since then, by his fine example and inspiring personal influence, he has raised his wing to still higher efficiency and morale, the enthusiasm displayed by the various squadrons for low-flying raids being most marked. On October 30 he accompanied one of these raids against an aerodrome; watching the work of his machines, he waited until they had finished and then dropped his bombs from 100 ft. altitude on hangars that were undamaged; he then attacked troops and transport in the vicinity of the aerodrome. While thus engaged he saw eight Fokkers flying above him; at once he climbed and attacked them single-handed; having driven one down out of control he was fiercely engaged by the other seven, but he maintained the combat until rescued by a patrol of our scouts. (M.C. gazetted March 27, 1915; D.F.C. gazetted November 2, 1918.)

Awarded a Second Bar to the Distinguished Flying Cross

Capt. Ross Macpherson Smith, M.C., D.F.C. (Australian L.H. and Australian F.C.) (Egypt).—On October 19 this officer, with Lieut. A. V. McCann

as observer, engaged and drove down an enemy two-seater. As it appeared to land intact he descended to a low altitude and, with machine-gun fire, forced the occupants to abandon the machine; he then landed alongside it, and while his observer covered the enemy officers he set light to their machine and completely destroyed it. To have effected a landing in an unknown country, many miles in rear of the enemy's advanced troops, demanded courage and skill of a very high order. (M.C. gazetted May 11, 1917; Bar to M.C., March 26, 1918. The awards of the D.F.C. and first Bar thereto are announced further on in this *Gazette*.)

Awarded a Bar to the Distinguished Flying Cross

Lieut. (A./Capt.) Frederick Warrington Gillett, D.F.C. (France).—A pilot of great dash and skill who, since August 3, has destroyed 12 hostile aircraft. On September 29, when on low-line patrol, he attacked three Fokkers, driving down one, which fell in flames. (D.F.C. gazetted November 2, 1918.)

Lieut. (A./Capt.) Sidney William Highwood, D.F.C. (France).—A courageous officer who has proved himself a skilful and bold fighter. Since October 2 he has destroyed three enemy machines and four kite balloons, and has in addition rendered valuable service in attacking enemy troops on the ground. (D.F.C. gazetted December 3, 1918.)

Sec. Lieut. William Stanley Jenkins, D.F.C. (France).—An exceptionally skilful pilot, conspicuous for his courage and disregard of danger. Since October 5 he has accounted for four enemy aeroplanes crashed and one driven down out of control. On November 10 he crashed an enemy two-seater, and later on destroyed a Fokker, in addition to attacking enemy troops and transport with marked success. (D.F.C. gazetted November 2, 1918.)

Maj. Allan Murray Jones, M.C., D.F.C. (Australian F.C.) (France).—By his keenness and enthusiasm Maj. Jones has inspired his squadron with a fine spirit of emulation and raised it to a high standard of efficiency. On November 10 he led his whole squadron on a low bombing raid against an enemy railway station. Descending to 100 ft., he remained at this low altitude till all his machines had completed the attack, though subjected to very heavy fire from machine guns. Owing to the steady deliberation of the attack very serious damage was inflicted on the trains and rolling stock. (M.C. gazetted April 26, 1917; D.F.C. gazetted June 3, 1918.)

Lieut. (A./Capt.) Camille Henri Raoul Lagesse, D.F.C. (France).—A scout leader of marked ability and daring who, since August 28, has destroyed 13 enemy aeroplanes, displaying at all times brilliant leadership and courage. On October 2, when leading a patrol of four machines, he dived on eight Fokkers; four of these were destroyed, Capt. Lagesse accounting for one. (D.F.C. gazetted November 2, 1918.)

Lieut. (A./Capt.) Walter Hunt Longton, D.F.C., A.F.C. (France).—Between September 29 and October 9 this officer carried out 12 tactical reconnaissances, bringing back most valuable information; he also displayed great gallantry in attacking enemy troops on the ground. On October 9, when on a low patrol, he observed a machine-gun nest which appeared to be the sole obstacle to our cavalry advance. Having informed the cavalry and field artillery of the situation, he co-operated with the former in their attack, and, after the enemy had been driven out, pursued them with machine-gun fire as they retreated. (D.F.C. gazetted November 2, 1918; A.F.C. gazetted June 3, 1918.)

Lieut. (A./Capt.) Oren John Rose, D.F.C. (France).—A brilliant and fearless leader who, since October 9, has destroyed seven enemy aeroplanes. His personal example of skill and determination in aerial combats and in attacking troops and transport on the ground is of the greatest value in maintaining the high standard of efficiency in his squadron. (D.F.C. gazetted December 3, 1918.)

Lieut. (A./Capt.) Benjamin Roxburgh-Smith, D.F.C. (France).—A leader of outstanding merit whose influence has had a great effect on maintaining the morale of his squadron. He has engaged in many combats with hostile aeroplanes, displaying marked skill and courage. Since May last he has accounted for 12 hostile machines. (D.F.C. gazetted November 2, 1918.)

Lieut. (A./Capt.) William Ernest Shields, D.F.C. (France).—Bold in attack and skilful in manoeuvre, this officer is conspicuous for his success and daring in aerial combats. On September 22, when on offensive patrol, he was attacked by 14 Fokkers; he succeeded in shooting down one. On another occasion he was attacked by six scouts and destroyed one of these. In all, since June 28, this officer has accounted for 14 enemy aircraft. (D.F.C. gazetted November 2, 1918.)

Capt. Ross Macpherson Smith, M.C., D.F.C. (Australian L.H. and Australian F.C.) (Egypt).—During the operations prior to October, 1918, he took part in numerous engagements involving flights of 150 to 200 miles, and succeeded in doing extensive damage to the enemy's hangars, railways, etc. Capt. Smith displayed most consistent gallantry with marked ability in all his work, whether bombing by night or day or in personal encounters in the air. Whilst operating with the Sheriffian forces he destroyed one enemy machine and brought down two others out of control in the desert. (M.C. gazetted May 11, 1917; Bar to M.C. March 26, 1918. The awards of the D.F.C., and second bar thereto, are also contained in this *Gazette*.)

Lieut. (A./Capt.) Walter Alfred Southey, D.F.C. (France).—An officer of ready resource whose skilful leadership is of the greatest value to his squadron. Since August 23 Capt. Southey has destroyed five enemy kite balloons and three machines, while he has also driven down two aircraft completely out of control. (D.F.C. gazetted November 2, 1918.)

Capt. Alfred Harold Whistler, D.S.O., D.F.C. (France).—This officer has 22 enemy machines and one balloon to his credit. He distinguished himself greatly on September 29, when he destroyed two machines in one combat, and on September 15, when, following two balloons to within 20 ft. of the ground, he destroyed one and caused the observer of the second to jump out and crash. He has, in addition, done arduous and valuable service in bombing enemy objectives, and obtaining information. Capt. Whistler is a gallant officer of fine judgment and power of leadership. (D.S.O. gazetted November 2, 1918; D.F.C. gazetted August 3, 1918.)

Awarded the Distinguished Flying Cross

Lieut. David Brunton Aiken. (Egypt).—This officer has done very gallant and useful work as patrol leader, and has set a fine example to his squadron. On one occasion, when on patrol over an enemy aerodrome, he descended to within 50 ft. of the ground, in face of incessant hostile fire, to attack a two-seater, which he rendered completely useless.

Sec. Lieut. (A./Lieut.) Gerald Frank Anderson. (France).—On October 30 this officer was one of an offensive patrol that attacked 50 enemy machines. Six of the latter concentrated their attack on Lieut. Anderson, and would have inevitably destroyed his machine had it not been for the exceptionally able manner in which he manoeuvred and fought. Although both he and his observer were wounded and the machine badly damaged, he succeeded with rare courage and skill in shooting down one and keeping the remainder at a distance. Eventually he brought his machine safely to ground about half a mile within our lines.

Lieut. (A./Capt.) George Buchanan Bailey. (France).—On September 28 this officer and his observer were detailed to watch the progress of one of our

divisions towards a canal. Flying very low, he discovered that the enemy were retiring to the east of the canal. He at once dropped a message informing the infantry of this, and they pushed rapidly forward, securing the crossings. This would certainly have been prevented by the enemy had it not been for Capt. Bailey's promptitude in accelerating our advance.

Lieut. Thomas Charles Richmond Baker, M.M. (Australian F.C.). (France).—This officer has carried out some 40 low-flying raids on hostile troops, aerodromes, etc., and has taken part in numerous offensive patrols; he has, in addition, destroyed eight hostile machines. In all these operations he has shown exceptional initiative and dash, never hesitating to lead his formation against overwhelming odds, nor shrinking from incurring personal danger. (M.M. gazetted February 19, 1917.)

Sec. Lieut. Gordon Arthur Ballantyne (France), Sec. Lieut. William Cubitt Treen, D.C.M. (France).—These officers displayed conspicuous courage and cool presence of mind on October 9, when they were attacked by seven Fokker biplanes. At the outset the pilot (Sec. Lieut. Ballantyne) received a bullet in his arm, and Sec. Lieut. Treen, his observer, was wounded in the head and had one knuckle of his right hand shot off; at the same time the woodwork between these two officers caught fire. Lieut. Treen, having beaten out the fire with his hands, engaged the enemy machines, and, aided by the consummate skill with which Lieut. Ballantyne—wounded though he was—manoeuvred the machine, succeeded in shooting down one in flames. (Sec. Lieut. Treen's D.C.M. gazetted March 11, 1916.)

Lieut. (A./Capt.) Charles Chaplin Banks, M.C. (France).—A brilliant and skillful airman who has been conspicuous for his success in aerial combats. On October 30 he, single-handed, engaged five enemy aeroplanes and drove one down out of control. In the fight his aileron controls were shot away, but by skillful handling and with cool presence of mind he brought his machine back and made a successful landing. In addition to the above Capt. Banks has accounted for nine other enemy machines. (M.C. gazetted February 9, 1918.)

Lieut. Robert Lyle McKendrick Barbour (France).—This officer has carried out 29 bombing raids and 47 photographic reconnaissances, displaying at all times marked courage and clear judgment. On October 9, when on reconnaissance, he was attacked by 10 Fokkers and forced to retire; on the disappearance of the Fokkers he again crossed the line; he was then attacked by three Fokkers, but these he drove off, shooting down one, which was seen to crash.

Sec. Lieut. William Thomas Barnes (France).—A skillful and gallant observer. On October 1, during an important reconnaissance, this officer's machine was attacked by six or seven Fokkers. After scattering them he saw an enemy aeroplane attacking one of our machines; he at once engaged it, shooting it down in flames. Shortly afterwards he shot down another enemy machine out of control.

Sec. Lieut. Oscar Berridge (France), Sec. Lieut. William Spriggs (France).—On October 17 these officers carried out a contact patrol reconnaissance of the enemy lines in the face of most trying weather conditions. Flying for three-quarters of an hour in pouring rain they located enemy troops, and dispersed them with bombs and machine-gun fire. They also engaged and shot down in flames an enemy two-seater. The courage and endurance displayed by these officers on this occasion deserve very high praise.

Lieut. Roger Derrick Campbell Blake (France).—This officer has displayed conspicuous bravery on many occasions, notably on November 11, when our cavalry, having temporarily lost touch with the enemy owing to their retirement, Lieut. Blake flew at under 50 ft. height some 20 or 30 miles east of our advanced posts. Arriving over an enemy aerodrome he saw a number of mechanics engaged in salving a machine; he attacked them, flying only a few feet from the ground, and in face of intense machine-gun fire succeeded in dispersing them, inflicting heavy casualties.

Sec. Lieut. John Stephen Blanford (France).—On October 5, when returning from a raid, the machine in which this officer was observer had all the controls shot away, except those of the rudder, and started to fall out of control. With great presence of mind he jammed his heels against the Scarffe mouning and leant over the side, so bringing the machine back into a straight glide. He remained in this position from 12,000 ft. until the machine crashed into some shell-holes. It was entirely due to the prompt action of Sec. Lieut. Blanford that the pilot was enabled to land the machine without injury.

Lieut. Clarence Stewart Bolsby (France).—This officer has rendered most valuable service on numerous contact patrols. Handicapped on many occasions by difficult visibility and smoke, and subjected to severe hostile fire, he has invariably displayed marked determination and devotion to duty, locating our own and enemy troops and furnishing most reliable reports which were of the greatest assistance in our operations.

Sec. Lieut. Clement Graham Boothroyd (France).—An officer of high courage. On October 23, after attacking with bombs a railway station, the formation with which this officer was flying was engaged with about 15 enemy scouts; of these, he destroyed one and his pilot accounted for a second. In all he has to his credit eight enemy aircraft and one kite balloon.

Lieut. George Spencer Bournier (France).—An officer of courage and resource who has rendered most valuable service on contact patrols. On September 28 he dived on a party of hostile infantry in a trench. As they waved white handkerchiefs he did not attack them, but, flying at 30 ft., he directed a party of our infantry towards them.

Lieut. Parcell Rees Bowen, M.C. (Egypt). 2nd Lieut. Robert Fawcett (Egypt).—These officers have displayed marked courage and determination on many occasions. On September 22 they carried out an excellent reconnaissance under difficult conditions, the clouds being very low over the hills, bringing back most valuable information. (Lieut. Bowen's M.C. gazetted August 16, 1917.)

Lieut. (A. Capt.) John Denis Breakey. (France).—This officer has flown about 500 hours on active service. He has carried out 170 special missions, and has bombed and attacked enemy troops, transport, &c., from low altitudes with great success, causing serious damage. Capt. Breakey has shown marked ability and skill as a flight leader, and by his fine spirit of determination and disregard of personal danger sets a fine example to other pilots.

Lieut. Walter Gerrard Brind. (France).—Since March, 1918, this officer has carried out 70 night-bombing raids and 14 night reconnaissances, displaying at all times marked perseverance and courage in carrying out orders, often in most adverse weather conditions. On November 10 he carried out a most successful raid on a railway station, descending to 1,200 ft., despite heavy hostile fire, and obtained 10 direct hits.

Lieut. Frederick John Shaw Brinell. (France).—This officer has flown about 500 hours on active service, and on all occasions, when engaged with the enemy, has shown great dash and marked courage. He has carried out some 162 special missions, and has engaged enemy troops, transport, &c., from very low altitudes with great success.

Lieut. (A. Capt.) Allan Runciman Brown (Australian F.C.). (Egypt). Lieut. Garfield Finlay (Australian F.C.). (Egypt).—On August 22 Capt. Brown, with Lieut. Finlay as his observer, attacked an enemy two-seater, forcing it to land in our lines. On four other occasions these officers have engaged and destroyed enemy aircraft, displaying marked gallantry and skill. In addition, they have rendered most valuable service in attacking enemy cavalry, anti-aircraft guns and other ground targets, inflicting heavy loss.

Sec. Lieut. John Renwick Brown. (France.) 2nd Lieut. Gerard Kanne-meyer. (France).—On October 14 these officers, unescorted, made a low reconnaissance of the enemy positions. They penetrated, at about 1,000 ft. altitude, some 9,000 yards behind the enemy lines, obtaining information of considerable value. On other occasions they have made accurate contact patrol reconnaissances and taken photographs at low altitudes, displaying absolute fearlessness.

Sec. Lieut. Sydney MacGillvary Brown. (France).—On October 28, when on offensive patrol, this officer, in company with three other machines, attacked nine Fokkers; three of the latter were destroyed, Sec. Lieut. Brown accounting for one. In addition, he has three hostile aircraft and one balloon to his credit. He is a fearless and intrepid officer.

Lieut. (Hon. Capt.) Leslie William Burbidge. (France).—On October 23 this officer displayed marked gallantry and bravery. After destroying a hostile machine his own machine collided, by mischance, with another of his formation on the return journey, and at once began to fall out of control. Capt. Burbidge, with great presence of mind and considerable personal risk, climbed out on to the damaged plane, and so enabled his pilot to regain partial control, maintaining this position till the machine slowly side-slipped on to the ground. By his courageous action this officer undoubtedly saved the life of his pilot at considerable danger to his own, for, on the machine striking the ground, he was thrown from the plane and received serious injuries to his face.

Lieut. (A./Capt.) Malcolm Graham Stewart Burger. (France).—During the last battles this officer displayed marked gallantry and devotion to duty on low-flying bombing patrols, inflicting heavy casualties on numerous occasions. He has destroyed three enemy machines, and forced another to land.

Sec. Lieut. (Hon. Lieut.) Robert Alan Caldwell. (France).—This officer has been conspicuous for his daring attacks on ground targets. On September 28, descending to 400 ft. over a town, he found it congested with transport. Flying along the streets, he dropped bombs with excellent results, and also attacked enemy troops with machine-gun fire. Later, he materially assisted the advance of our infantry by diving on and engaging the enemy holding a bridgehead.

Lieut. (A./Capt.) Robert North Chandler. (France).—In aerial fighting this officer has destroyed three enemy aircraft and driven down two others out of control. He has also displayed marked courage in attacking enemy troops, etc., on the ground. On October 28, having attacked enemy troops with great success and silenced an anti-tank gun, he later on silenced two enemy machine guns and inflicted heavy casualties on infantry in shell holes. Whilst so engaged his machine was hit in the engine and he was forced to land.

Lieut. Joel Gordon Hirst Chrispin. (France).—This officer has carried out over 80 bombing raids far into enemy country and has shown most consistent determination and gallantry, notably on November 4, when, leading a formation of some 60 machines to bomb an enemy aerodrome, he encountered a large number of enemy aircraft. His progress was also seriously interfered with by many thick clouds. Undeterred by these difficulties, he never wavered, but led the whole raiding party straight to the objective, and descending to the low altitude of 1,000 ft., inflicted very serious damage on the aerodrome.

Lieut. (A./Capt.) Joseph William Greig Clark (Cen. Ontario R.). (France).—On October 5 this officer carried out a very successful shoot, causing a fire and an explosion, and completely destroying the position. During the shoot he was continually harassed by eight Fokker biplanes, but, exhibiting marked courage and skilful shooting, he drove down one in flames and dispersed the remainder.

Lieut. (Hon. Capt.) Charles Thornton Cleaver, M.C. (France). Lieut. (A. Capt.) Arthur Frederick Peacey. (France).—On October 11 these officers carried out a most daring and successful contact patrol. Flying at an average height of 50 ft. in the face of extremely heavy machine-gun fire, they at times descended to 20 ft. to enable Capt. Cleaver to communicate with the troops. Much valuable information was obtained as to the strength and location of the enemy, proving of the greatest assistance to our troops. The machine and engine were hit by fire from the ground, but although these officers fully realised this they refused to leave the lines until the reconnaissance was completed. (Capt. Cleaver's M.C. gazetted October 20, 1916. Bar to M.C. June 18, 1917.)

Lieut. Thomas Linnaeus Coates. (France).—On October 28 this officer's balloon was attacked by enemy aircraft and brought down in flames. Lieut. Coates descended in a parachute, but fell through the branches of a tree and was badly shaken. In spite of this, with most praiseworthy devotion to duty, he immediately re-ascended, and remained up till dark. On a previous occasion he was forced to parachute, and, despite a bad landing, at once re-ascended.

Capt. Adrian Trevor Cole, M.C. (Commonwealth Military Forces and Australian F.C.). (France).—On October 7 this officer carried out a most successful flying raid on enemy railway lines and stations. The success of the attack was largely owing to his cool and determined leadership, and our freedom from casualties was mainly due to the methodical manner in which he collected and reorganised the machines after the raid. He himself displayed marked initiative and courage in attacking troops and other objectives. Since May Capt. Cole has destroyed four hostile machines. (M.C. gazetted August 16, 1917.)

Lieut. (A. Capt.) John Collier. (France).—An officer of conspicuous determination and bravery. Under most unfavourable weather conditions he carried out, on November 8, a very important reconnaissance. Flying at a low altitude, he obtained a complete report which was correct in all details and of the greatest assistance to our advance. Capt. Collier is a fine leader, and has an enemy machine to his credit.

Lieut. Kenneth Burns Conn (3rd Res. Bn., Can. E.F.). (France).—On October 18, when raiding enemy troops in retreat, this officer descended to 300 ft. and attacked three companies of infantry with machine-gun fire, inflicting casualties. So vigorous was his attack that the troops dispersed. Lieut. Conn then attacked various other targets, displaying conspicuous skill and initiative.

Sec. Lieut. (A. Capt.) Norman Cooper (73rd Squadron). (France).—A fearless and skilful airman who has destroyed two enemy aircraft and driven down three others out of control. On October 3 certain of our troops were held up by a body of the enemy. Observing this Sec. Lieut. Cooper dived and engaged them, driving them out of their trenches with machine-gun fire, and so enabled our troops to advance.

Lieut. Alfred Frank Corker. (France).—This officer has carried out 80 night-bombing raids, displaying conspicuous courage and disregard of danger. He has also been most successful in attacking ground targets. On the night of October 14-15 he attacked a train and obtained a direct hit, causing a fire and an explosion.

Lieut. (Hon. Capt.) Hugh Aldred Courtenay. (Egypt).—On September 21 this officer attacked an enemy column with bombs and machine guns from an altitude of 500 ft. in extremely difficult country. He secured a direct hit on the head of the column, thus blocking the road and enabling our troops to capture large quantities of guns and other material. Capt. Courtenay is a keen and zealous officer of great initiative.

Lieut. Earl Frederick Crabb. (France).—A scout pilot of high merit: he is fearless and skilful. On October 27, having himself crashed an enemy machine, he went to the assistance of one of our own that was being attacked,

and materially helped to shoot the enemy down. In addition to the foregoing, he has accounted for three other machines and has assisted in crashing a fourth.

Lieut. (A. Capt.) Eric Douglas Cummings (Australian F.C.). (France.)—This officer has proved himself an able and determined leader of offensive patrols. In carrying out these raids he has met with conspicuous success, heavy damage being inflicted on enemy material and personnel. This has been due in the main to his brilliant leadership and skilful navigation. Capt. Cummings possesses, in a marked degree, courage, combined with cool judgment.

Sec. Lieut. Edgar George Davies. (France.)—Bold in attack and skilful in manoeuvre, this officer never hesitates to attack the enemy when opportunity occurs, without regard to disparity in numbers. On October 7, with three other machines, he attacked seven Fokkers; four of these were destroyed, Sec. Lieut. Davies accounting for one. Since September 16 he has to his credit four enemy machines and one kite balloon.

Lieut. Gordon Davies. (France.)—This officer has rendered conspicuous service during the last of the operations on counter-attack patrols, invariably showing marked initiative and determination. On several occasions he has carried out his mission successfully under adverse weather conditions when other officers have failed.

Sec. Lieut. Oswald Charles Dawson. (Egypt.)—This officer rendered exceptionally valuable service between September 19 and 26, when acting as observer to Capt. Hanmer. The information he brought back was of the greatest value to the Desert Mounted Corps and materially assisted operations.

Lieut. Robert Saunders De Bruyn. (France.)—On October 31 this officer carried out two photographic reconnaissances, completing seven hours and 50 minutes' flying and bringing back 70 exposed plates and much valuable information. On another occasion he obtained 24 exposures, flying for 4½ hours. These are only two out of 37 successful photographic reconnaissances carried out by this officer, all entailing work of an arduous and trying nature on long solo flights at very high altitudes, frequently in adverse weather conditions. In this service Lieut. De Bruyn has shown gallantry and determination of a high order.

Lieut. (A. Capt.) Roy Edward Dodds. (France.)—An officer who possesses high courage combined with great power of leadership. He has taken part in 60 bombing raids far over enemy territory, a large number of which he has led. In addition he has carried out a number of successful photographic reconnaissances, frequently meeting and overcoming strong hostile aerial resistance. In the course of these flights he has destroyed four enemy machines, and his observer has accounted for three others. A fine achievement, for the machine he flies is designed for heavy bombing and long reconnaissance rather than for aerial combats.

Capt. Eric George Edward Donaldson. (France.)—This officer has led 27 bomb raids, displaying at all times conspicuous courage and perseverance. On October 3, when on artillery reconnaissance, he saw one of our machines pressed by six enemy aircraft. Single-handed, he went to assist, and, pressing home his attack with vigour and determination, he forced the enemy to relinquish the engagement and retire over their lines.

Maj. (A. Lieut.-Col.) William Sholto Douglas, M.C. (France.)—A very gallant officer and brilliant leader to whose personal influence and example is mainly due the fine record of his squadron which, since September 21, 1917, has destroyed 201, and driven down out of control 149 enemy aircraft. On October 17, 18 and 19 last Maj. Douglas carried out most successful reconnaissances of the army front at exceptionally low altitudes (at times descending to 20 ft. owing to dense clouds) and in face of intense hostile fire and machine-gun fire. (M.C. gazetted January 14, 1916.)

Lieut. John Foster Drake. (France.)—This officer has taken part in 70 successful raids and reconnaissances, and has been conspicuous for his tenacity and devotion to duty. On November 1 he was one of a formation of six that was attacked by 25 enemy aeroplanes, and a running fight of 18 miles ensued. Being the rear unit of the formation, and maintaining that position throughout, the brunt of this severe attack was borne by this officer, and his endurance and skill against overwhelming odds undoubtedly saved the formation.

Lieut. Frank Falconer Dutton, M.C. (Egypt.)—An officer of great courage and endurance who sets an inspiring example to his flight. On September 19 he flew for 7½ hours, carrying out an extremely valuable artillery patrol, which enabled our artillery to silence a number of enemy batteries, in addition to tactical and bombing flights. (M.C. gazetted September 22, 1916.)

Sec. Lieut. Gower Wynn Elias. (France.)—This officer has rendered most valuable service on contact and other patrols, the information obtained being invariably most accurate and of great value. On October 9 his machine was hit by anti-aircraft fire and was rendered out of control; with rare presence of mind and courage he climbed out of the plane, thus balancing the machine and enabling his pilot to land in safety.

Lieut. William Elliot. (Egypt.)—On September 27 this officer was detailed to drop an ultimatum on a body of hostile troops some 5,000 strong. Descending to 400 ft., although exposed to intense rifle and machine-gun fire, he remained until he actually saw the message picked up; a fine example of determination and courage. He returned with his machine badly shot about.

Capt. (A. Maj.) Edwin Cheere Emmett, M.C. (South African Defence Force). (Egypt.)—During the late operations this officer has been distinguished for gallantry and devotion to duty. Before an attack he took a series of oblique photographs of the enemy's lines—a service that entailed considerable personal risk, as he was compelled to fly at a very low altitude in the face of heavy machine-gun fire. (M.C. gazetted February 1, 1917.)

Lieut. Arthur Reginald Fairbairn. (France.)—During recent operations this officer's balloon was singled out for attack three times in two days. On the third day he was again attacked by six scouts when at a height of 1,500 ft. He behaved with the utmost coolness and gallantry in helping his fellow observer, who was inexperienced, out of the basket before parachuting himself. His determination in pushing his balloon forward during the recent advance has been most praiseworthy.

Lieut. Jules Edward Ferrand. (France.)—On October 26 this officer took part in an engagement with a large hostile formation. Singling out a Fokker he attacked it at close range, driving it down to crash. Being isolated from his companions he turned to regain our lines but was at once attacked by seven Fokkers, who kept up a running fight for many miles. He maintained a stout defence against these long odds, crashing two of the enemy machines, and eventually reaching our lines with all his ammunition exhausted.

Lieut. (A. Capt.) Charles Findlay. (France.)—On October 29 this officer led his flight with the greatest dash and determination against a hostile formation of about 50 machines. Reinforced by six more machines—making a total of 12 in all—he fought his patrol against the enemy's overwhelming numbers for upwards of half an hour, but the enemy being continuously reinforced he was eventually forced to withdraw. Cleverly extricating his formation, he retired across the lines, our only casualties being one pilot and one observer wounded. The enemy lost heavily, five machines being shot down in flames (one by Capt. Findlay), four destroyed, and six driven down out of control.

Lieut. Howard Bowden Fletcher (Australian F.C.). (Egypt.)—On August 24 two of our machines, Lieut. Fletcher being the observer in one, engaged seven hostile aircraft; this officer and his pilot, in the combat that

ensued, crashed two, one of which burst into flames on hitting the ground. Lieut. Fletcher has also rendered most valuable service on photographic reconnaissances and in obtaining information concerning roads, etc., displaying at all times a devotion to duty and disregard of personal danger deserving of high praise.

Lieut. (A. Capt.) Kivas Burton Forster (Manitoba R.). (Italy.)—This officer had rendered most valuable service in co-operation with our artillery, displaying in this service keenness and devotion to duty worthy of high praise. He also carried out, during one of the later battles, several patrols, obtaining much valuable information.

Lieut. Charles Frederick Frank. (France.)—Lieut. Frank has co-operated with our artillery in 184 successful shoots, proving himself an exceptionally capable and efficient officer, with keen powers of observation. On October 8, under most difficult conditions, he succeeded in giving observation for three shoots. During this flight, owing to his proximity to actual operations, he was enabled to transmit valuable information to our hostile infantry movements.

Lieut. (A. Capt.) Maurice Michael Freehill. (France.)—A brilliant leader who has destroyed five enemy aircraft and has displayed conspicuous bravery, in attacking enemy troops on the ground. On November 4, observing that a machine-gun post was holding up the advance of our infantry, he attacked it from a very low altitude, inflicting heavy casualties on the crews and putting them to flight. Later on he carried out a reconnaissance of the Army front at a height of 50 ft. in the face of intense machine-gun fire, bringing back most valuable information.

Lieut. Hudson Fysh (Australian F.C.). (Egypt.)—A skilful observer, conspicuous for courage and determination, whether engaging the enemy in the air or attacking ground targets. He has taken part in numerous combats resulting in loss to the enemy, and has inflicted serious damage on hostile camps and aerodromes.

Lieut. (A. Capt.) William Dalrymple Gairdner. (France.)—This officer has carried out 71 successful bombing raids and 11 photographic reconnaissances, displaying brilliant and courageous leadership on all occasions. On November 4, while leading a photographic reconnaissance he was continuously harassed by enemy scouts. In the engagement four out of the 14 enemy machines were accounted for, Capt. Gairdner driving down one out of control. This fine achievement was mainly due to his brilliant leadership.

Sec. Lieut. James Victor Gascoyne. (France.)—During the months of October and November this officer has accounted for five enemy machines, and during recent operations he has displayed splendid daring and great skill in attacking enemy troops, etc. On November 9, although he was wounded in the head early in the attack and his machine was badly shot about, Sec. Lieut. Gascoyne made a most successful attack on the enemy from a height of 100 ft., obtaining three direct hits and inflicting heavy casualties.

Sec. Lieut. (Hon. Capt.) Gordon Harvey Gillis. (France.)—This officer has carried out 18 successful bombing raids, showing at all times complete fearlessness and disregard of danger, notably on August 30, October 9 and October 14, when he rendered conspicuous service, causing heavy material damage to the enemy and bringing back valuable information.

Lieut. (A. Capt.) Frank Clifton Gorringer, M.C. (France.)—During recent operations this officer was conspicuous for his gallantry and initiative in attacking enemy troops, transport, etc., notably on November 9, when, locating certain enemy troops dug in, he attacked them from 50 ft. altitude, causing numerous casualties. He then landed close behind our infantry and informed them of the enemy's position. (M.C. gazetted March 4, 1918.)

Sec. Lieut. James Graham. (France.)—In the late advance this officer rendered most gallant and valuable service on contact patrols, locating our own and the enemy troops in spite of difficulties owing to smoke and mist, and in face of heavy hostile fire. While carrying out these duties he has frequently been opposed by hostile aeroplanes, and has proved himself an officer of courage and determination. On October 8 he was attacked by seven hostile scouts; one of these was shot down. In the combat both he and his observer were wounded, but, nevertheless, he succeeded in evading the enemy, though owing to all his controls being shot away he was compelled to land in "No Man's Land," only reaching our lines after dark.

Sec. Lieut. James Herbert Grahame (107th Sqdn.). (France.)—This officer has taken part in 24 successful bombing raids, and has consistently carried out his duties with the greatest perseverance, courage and skill, obtaining a number of direct hits on the objectives, resulting in serious damage to enemy material.

Lieut. (A. Capt.) Duncan Grinnell-Milne. (France.)—This officer has shown exceptional gallantry and disregard of danger on numerous occasions, notably on October 5, when he obtained a direct hit on a train with a bomb; he then attacked and destroyed in flames a balloon on the ground. On his return journey he attacked troops and transport with marked success, dropping his last bomb in the middle of a crowd of enemy troops.

Lieut. (A. Capt.) Philip Grosset. (Italy.)—An officer of untiring energy who has been remarkably successful in photographic and trench reconnaissance, taking on one day no less than 53 successful photographs in spite of most adverse weather conditions. He has also rendered excellent service on contact patrols in the late advance, his reports being invariably accurate and of great value.

Lieut. Frank Lucien Hale. (France.)—A brilliant and very gallant officer who never hesitates to attack the enemy however superior in numbers. On September 27, Lieut. Hale, single-handed, attacked a formation of 10 Fokker biplanes who were manoeuvring to attack one of our bombing formations; engaging one of the Fokkers, he drove it down out of control, and it was seen to break up in the air. By this gallant action the enemy were diverted from their objective. In the combat Lieut. Hale's machine and engine were badly damaged; despite this, he, on his return journey, attacked a solitary Fokker and drove it down out of control. This officer has accounted for eight enemy aircraft.

Lieut. (A. Capt.) Wallis Halford. (France.)—This officer has taken part in 90 night bombing raids, frequently under adverse weather conditions, and in the face of heavy anti-aircraft fire. On the night of June 29-30 he carried out three such raids, dropping 52 bombs on his objective with excellent results. By his keenness and determination he inspired all who serve with him.

Lieut. (Hon. Capt.) Joseph Eskel Hallonquist (19th Res. Bn., Canadians). (Italy.)—This officer at all times displays the highest skill and courage, setting a fine example to other pilots. He has accounted for five enemy machines, and, during the recent operations, has led four successful bombing patrols at low altitudes.

Lieut. Leslie Hamilton. (Salonika.)—A gallant and skilful scout pilot who never hesitates to attack enemy formations, however superior in numbers. During recent operations he has rendered exceptional service. He has himself brought down, or assisted to bring down, six enemy machines.

Lieut. Norman Henry Hamley. (Italy.)—This officer is conspicuous for courage and determination. During the recent operations he has led five bombing patrols, attacking, with great success, retreating columns of hostile troops and transport, from low altitudes. In addition, on October 29 he destroyed an enemy machine.

Capt. (A. Maj.) Henry Ivan Hanmer. (Egypt.)—A brilliant and very gallant airman who is gifted with great organising powers combined with endurance and disregard of personal danger. He led the machines that were detailed to keep in touch with the Desert Mounted Corps, and it was due to Capt. Hanmer's energy and personal supervision that our machines were enabled to render the assistance they did.

Lieut. (A. Capt.) James Donald Innes Hardman. (France).—A bold and courageous officer who has shown most praiseworthy devotion to duty, both in the March retreat and during the more recent operations. On October 30, while escorting a bombing raid, he, with his flight, encountered some 40 enemy machines. In the combat that ensued he shot down two, and it was mainly due to his cool judgment and skill in leading that the flight inflicted heavy casualties on the enemy, destroying five machines and driving down another out of control. In all, this officer has seven hostile aircraft to his credit—destroyed or driven down out of control.

Sec. Lieut. Thomas Montagu Harries (24th Sqdn.). (France).—A fearless and gallant officer. On October 12, whilst flying at 100 ft. altitude, he observed 12 enemy machine guns in action. Diving, he attacked them, silencing eight and compelling the other four to limber up and withdraw.

Lieut. (A. Capt.) Richard Harrison. (France).—Owing to his skill and initiative this officer has been able to obtain most valuable information which has proved of the greatest assistance to our advance, notably on October 29, when he carried out a reconnaissance to clear up the situation in a certain area. This information was urgently required. Flying at an extremely low altitude, Capt. Harrison not only succeeded in locating our troops and those of the enemy, but he also obtained an accurate estimate of their respective strength. He further observed and reported the position of six enemy batteries in action, which were in consequence successfully engaged by our artillery.

Sec. Lieut. Robin Howard Haworth-Booth. (Sea Patrol, Aegean).—For gallantry and skill during a raid on Constantinople on October 25, 1918, in which he decoyed two enemy fighters into such a position that they were eventually shot down by his observer. This officer ran considerable risks in the methods he adopted, but the success attained justified his courageous action and pertinacity.

Lieut. (A. Capt.) Allan Hepburn. (France).—On October 12 this officer made a very fine flight, calling for courage and determination of a high order. Thick clouds were within 200 ft. of the ground and the visibility was so bad that practically no flying was attempted. Despite these adverse conditions this officer volunteered to cross the lines. Climbing through the clouds, which were several thousand feet in depth, he flew above them, guided by compass, with no view of the ground. Continuing his flight until he estimated that he was in the vicinity of a certain objective, he descended, and found himself 150 ft. over an enemy railway station. Dropping his bombs, he destroyed a passenger train, and afterwards engaged enemy troops and transport with machine-gun fire. Having caused considerable damage, Capt. Hepburn climbed through the clouds and found his way home.

Sec. Lieut. (A. Capt.) Oscar Alois Patrick Heron. (France).—An officer conspicuous for his skill and daring in aerial combats. He has accounted for eight enemy aeroplanes. On September 28 he attacked, single-handed, three Fokkers; one of these he shot down. On another occasion he, in company with five other machines, engaged six Fokkers, all six being destroyed. Sec. Lieut. Heron accounting for two.

Lieut. Geoffrey Bruce Hett. (France).—This officer has taken part in 50 bombing raids, proving himself a capable and resolute officer. On October 30 during a return journey, his formation was attacked by 30 scouts. Lieut. Hett, flying in the rear, bore the brunt of this heavy attack. With skill and cool judgment he so manoeuvred his machine that his observer was enabled to destroy two of the hostile aircraft before he was seriously wounded. Facing the enemy scouts, Lieut. Hett maintained a successful combat until they were driven off by the arrival of some of our scouts.

Maj. Henry Philip Lamton Higman. (France).—Since August 8 this officer has rendered exceptionally valuable service. On October 10, when observing from his balloon some 2,500 yards from the lines, he was subjected to constant anti-aircraft fire, and was also attacked by four enemy machines. His balloon being riddled by hostile fire, he was compelled to descend in a parachute. Although under shell fire, he at once had the balloon repaired and again ascended, completing his observation and furnishing most useful information.

Sec. Lieut. (Hon. Lieut.) John Charles Francis Holland. (Salonika).—During a period of seven months this officer has flown over 200 hours, carrying out many long distance reconnaissances and contact patrols and rendering most valuable service. On one patrol his machine, in company with another, was attacked by five others. One of these was shot down and the remainder were driven off. The reconnaissance was successfully completed.

Lieut. Thomas Stanley Horry. (France).—An officer of exceptional courage and daring. On November 5, in face of driving rain and low clouds, he led his patrol far into enemy territory in order to engage enemy troops and transport that were retiring. Reaching his objective, he attacked the enemy with vigour, causing heavy casualties. He has in all destroyed three enemy aircraft and driven down another out of control, and has, in addition, taken a leading part in the destruction of six others.

Sec. Lieut. Frederick John Hunt. (France).—A bold and skilful airman who has accounted for three enemy machines and two hostile balloons.

Capt. Leonard Franklin Hursthouse. (Italy).—This officer has rendered most valuable service on reconnaissance and photographic duty, frequently under very adverse weather conditions. On October 30 he took a prominent part in an attack on hostile columns, dropping his bombs and scattering personnel with machine-gun fire from a very low altitude. Whilst so engaged he was severely wounded, but managed to bring his machine back.

Capt. Reginald Vye James. (France).—This officer has taken part in 17 bomb raids, 13 of which he has personally led. The success of these raids has been largely due to the determination and courage Capt. James displayed, combined with leadership of high merit.

Lieut. (A. Capt.) Olaus Charles William Johnsen. (France).—A brilliant leader and gallant fighter. On October 1 this officer led a bombing formation against a railway junction, and, owing to his skilful leadership, serious damage was caused. Three big explosions occurred in the station, wrecking a number of trucks, and a factory near by was demolished. He has taken part in 34 raids, 28 of which he has led. He has accounted for five enemy aeroplanes.

Lieut. Hugh Robert Junor. (Egypt).—On September 17 this officer performed an act of conspicuous merit and gallantry. Single-handed, he engaged five enemy machines, and so protected the Arab force from aerial attack at a most critical time when they were engaged in destroying an important railway. Lieut. Junor continued the combat till he was driven down by force of numbers, his petrol supply being practically exhausted.

Lieut. Edward Patrick Kenny, M.C. (Australian F.C.). (Egypt).—Since joining the squadron in July last this officer has carried out 360 hours' flying on strategic and photographic reconnaissances. He has, in aerial combats, destroyed one enemy machine, driven down two out of control, and forced four to land. During recent operations he has shown great gallantry on numerous occasions in attacking ground targets from very low altitudes in face of intense hostile fire. (M.C. gazetted September 16, 1918.)

Lieut. (A. Capt.) Andrew Cameron Kiddie. (France).—A gallant officer, who has proved himself resolute and courageous in aerial combats. He has to his credit six enemy machines and one balloon shot down in flames.

Lieut. (A. Capt.) Charles Stewart Touzeau Lavers. (France).—On a recent occasion this officer led his scout formation, escorting bombers to an objective 39 miles over the lines; all the bombing machines were brought

afely back. This was the twentieth successful escort formation that he led during a period of two and a-half months. On several occasions enemy aeroplanes have attacked his formation, but they have invariably been driven off, which reflects the highest credit on his skill and determination. He has several machines to his credit, and has assisted in the destruction of others.

Lieut. George Edgar Bruce Lawson. (France).—A pilot of courage and skill, bold in attack and gallant in action, who has accounted for five enemy aeroplanes. On September 27 he attacked 15 Fokker biplanes that were harassing one of our bombing formations, driving down one in flames. He then engaged a second; in the combat the two machines collided, and the enemy aeroplane fell down completely out of control. Although his machine was badly damaged, Lieut. Lawson successfully regained our lines.

Sec. Lieut. (Hon. Lieut.) Cyril Reginald Leeke. (France).—This officer has displayed conspicuous courage and devotion to duty on many occasions, notably on November 1 when flying as observer on artillery and counter-attack patrol. On this occasion his machine was attacked three times by large hostile formations, one numbering 14. With marked skill and cool courage he drove off these attacks, thus enabling his pilot to carry out his reconnaissance.

Lieut. (A. Capt.) William Alexander Leslie. (France).—This officer has carried out 63 successful night bomb raids and nine successful night reconnaissances. On seven occasions he has carried out three raids in one night. Frequently, owing to adverse weather conditions, he has only succeeded in reaching his objective by the exercise of great determination and skill. However severe the hostile fire may be, Capt. Leslie never hesitates to descend to low altitudes in order to make certain of hitting his objective.

Lieut. (A. Capt.) Harry Nelson Lett. (France).—This officer has carried out 80 successful bombing raids and nine photographic reconnaissances, displaying at all times high personal courage and initiative. On November 1 his formation was attacked by about 25 enemy machines. Although outnumbered by nearly four to one, the formation destroyed one scout and drove down two others out of control. This fine achievement was largely due to Capt. Lett's most able leadership.

Lieut. (A. Capt.) Hugh Pugh Lloyd, M.C. (France).—This officer has rendered signal service on many occasions, notably on November 1, when, noticing four hostile batteries harassing our advancing infantry, he, by sending calls to our artillery, succeeded in silencing them. During this fight he was continuously attacked by hostile formations, which he succeeded in driving off; despite this opposition he carried out a low reconnaissance, obtaining most valuable information as to the position of our advanced troops. (M.C. gazetted June 22, 1918.)

Sec. Lieut. (Hon. Lieut.) Frank Masterman Loly. (France).—This officer has done over 200 hours' war flying as an observer. On October 18, accompanying the leader of a special bombing raid, he descended in his heavy bombing machine to 2,500 ft. above an enemy railway station. From this altitude, unusually low for the type of machine, and in face of heavy fire, he, with remarkable coolness and precision, aimed his bombs; one fell on the station buildings, and another on an ammunition train, which was completely destroyed.

Sec. Lieut. Colin Luke Lowe. (France).—During unfavourable misty weather this officer has shown most undaunted perseverance in carrying out low-flying patrols over the enemy lines, and in obtaining the maximum amount of information. On October 19 he stayed up four hours; for the greater part of this time he was over the enemy lines at a height of between 50 and 300 ft. He brought back most valuable information, warning our advancing infantry of a machine gun ahead of them, thereby probably saving a number of casualties.

Lieut. (A. Capt.) James McBain. (France).—This officer has rendered conspicuous service on reconnaissance duty his reports being exceptionally clear and accurate. The majority of these reconnaissances have been carried out at very low altitudes, and in face of severe hostile fire. Complete reliance could always be placed on any information he brought back, however unfavourable the conditions were under which the reconnaissance was made.

Lieut. Ashley Vernon McCann (Australian L.H. and Australian F.C.). (Egypt).—A keen and gallant officer who has rendered conspicuous service during recent operations in attacking hostile troops on the ground. On October 19 he, in company with his pilot, Capt. Smith, performed a very gallant act. They engaged a hostile two-seater many miles over the enemy lines and drove it down; it appeared to land intact, but the occupants were forced to abandon it owing to machine-gun fire. Lieut. McCann and Capt. Smith thereupon landed, and, keeping the enemy officers covered by machine-guns, set light to their machine, completely destroying it.

Lieut. Paul Joseph McGuinness, D.C.M. (Australian F.C.). (Egypt).—A bold and gallant airman who has displayed marked initiative and skill in attacking and destroying enemy aircraft, notably on August 24, when, with his observer, he crashed two enemy machines in an engagement against heavy odds. He has also carried out successful attacks on enemy aerodromes, inflicting heavy casualties and causing serious damage. (D.C.M. gazetted May 31, 1916.)

Lieut. John Alexander McGregor. (France).—On October 15 this officer rendered valuable and gallant service when on contact patrol. Flying at a height between 200 and 300 ft. in exceptionally bad weather, and in face of intense hostile fire, Lieut. McGregor obtained most valuable information as to the position of our troops and those of the enemy. Owing to the heavy fire to which he was subjected his petrol tank was pierced, and he was compelled to descend in "No Man's Land." On regaining our lines he at once reported to the nearest battery, and as a result of the information he was able to give artillery fire was opened on enemy forces that were advancing to attack.

Lieut. George Douglas Machin. (France).—This officer sets a fine example of cool courage and devotion to duty to all balloon officers of his section. Subjected to heavy shell fire, with his balloon damaged by same, he has on several occasions remained in the air and continued his observations. Twice his balloon so damaged fell rapidly, landing him on the roof of a house the first time, and on the second occasion in a wood. On another occasion, forced to make a hurried descent, his parachute collided with that of his fellow observer, and he had a heavy shock on landing. Unshaken by such incidents, he retains his keenness and nerve.

Lieut. John Macleod Mackay (87th Can. Bn.). (France).—Since April this officer has carried out over 130 patrols, and has been conspicuous for his gallantry and devotion to duty, both in attacking ground targets and in aerial combats. In the latter he has accounted for two enemy machines.

Lieut. (A. Capt.) John Harry McNeaney. (France).—A gallant and courageous airman who has accounted for five enemy aeroplanes, displaying at all times marked skill and devotion to duty. On September 28, in company with two other machines, he engaged about 10 Fokkers; four of these were destroyed, two by Lieut. McNeaney.

Lieut. (A. Capt.) Finlay McQuistan. (France).—By his example of determination and courage Capt. McQuistan has inspired the greatest confidence in the other pilots of his squadron. He has led over 30 squadron offensive patrols, and the success attained by his squadron during the past three months is largely due to his skilful leadership. This officer has destroyed or driven down out of control nine enemy machines.

(To be concluded next week.)



Casualties

Capt. HAROLD HARTLEY (DICK) BARON, R.A.F., second son of Mr. and Mrs. John Baron, 112, Marine Parade, Brighton, formerly of Lindfield, died on February 7 at the age of 33, at Somerville Hospital, Oxford, from complications following appendicitis.

Lieut. EDWARD HAROLD DIMMOCK, R.A.F., who died of pneumonia at Mount Dore Hospital, Bournemouth, on February 3, was the younger son of the late Edgar F. Dimmock, and of Mrs. Dimmock, 4, Ellesmere Court, S.E.

Lieut. BASIL RAHERE GARROD, 1st Loyal North Lancashire Regt., attached 149th Squadron, R.A.F., youngest and last surviving son of Col. Sir Archibald Garrod, K.C.M.G., A.M.S., of 9, Chandos Street, W., and Wilford Lodge, Melton, Suffolk, died on February 4 at the age of 24, from pneumonia.

Capt. CECIL FREDERICK KING, M.C., D.F.C., Croix de Guerre (avec Palme), R.A.F., son of Mr. and Mrs. F. H. King, Springfield Dukes, Chelmsford, was killed, the result of a collision in the air at Sedgeford, Norfolk, on January 24th, aged 19 years 11 months. He was educated at Verites, Charterhouse. On leaving school early in 1917 he joined the Royal Flying Corps, and in September of that year went to France, where he served continuously for thirteen months as flying officer and flight commander. He shot down 22 enemy machines, 19 of which were officially confirmed. He also did fine work in attacking enemy troops at low altitudes with his machine-guns and bombs. The French decoration was awarded to him for services rendered to the French Army during the second battle of the Marne, July, 1918. Capt. C. F. King was recently transferred to Sedgeford as a fighting instructor. The funeral took place at Docking (near Sedgeford) on February 4, with full R.A.F. honours.

Married

Maj. CHARLES E. BRYANT, D.S.O., 7th Hussars and R.A.F., was married on February 4 at Holy Trinity Church, Sloane Street, to Mrs. LIONEL PLATT.

Capt. JOSEPH WILLIAM COOK, North Staffs Regt. (attached R.A.F.), son of the Right Hon. Sir Joseph Cook, G.C.M.G., Minister of the Navy in the Commonwealth Government of Australia, and Lady Cook, was married on February 8 at Golder's Green Wesleyan Church, to CONSTANCE MARION WATSON, only daughter of Mr. and Mrs. J. B. Watson, The Ridgeway, Golder's Green.

Lieut. ETIENNE BRUNO HAMEL, R.A.F., eldest son of Mr. and Mrs. Felix Shaw, of Bole Hall, Tamworth, was married on Wednesday, February 5, quietly, at Christ Church, Lancaster Gate, to EVELYN MONA, only daughter of Mr. Oscar BARTLEY, of 69, Lancaster Gate, Hyde Park.

Lieut. FELIX CURZON HAMEL, Australian Flying Corps, second son of Felix Hamel, of Bole Hall, Tamworth, was married on February 1 at St. George's, Bloomsbury, to MIRIAM ELLA STEWART, eldest daughter of GILBERT G. BLANE, of Foliejon Park, Windsor, and Alltan Donn, Nairn.

Lieut. STANLEY FRANK RAVENHILL HULBERT, R.A.F. (late R.N.D.), second son of Maj. and Mrs. Harry Ravenhill Hulbert, of 11, Palace Gardens Mansions, London, W. 8, was married on February 1 at St. Peter's, Parkstone, to EVELYN MAUDE, widow of Lieut. D. H. V. WILSON, R.N., and only daughter of Mr. and Mrs. T. C. Hooman, of Lilliput, Dorset.

Maj. CHARLES EDWARD HASTINGS MEDHURST, O.B.E., M.C., R.A.F., second son of the late Rev. C. E. Medhurst, Vicar of Collingham, Yorkshire, and Mrs. Medhurst, was married on February 1 at St. Oswald's, Fulford, to CHRISTA-



Hendon Meetings Coming Back

THE hope that we may soon see exhibition flying at Hendon is encouraged by an application which was made by the Grahame-White Aviation Co. last week at the Wealdstone Petty Sessions for the renewal of the licence of the refreshment rooms at Hendon. Sir Archibald Bodkin, who appeared in support of the application, said it was proposed to use the aerodrome as a starting-place in connection with

BELL ELIZABETH, youngest daughter of the Rev. T. E. B. GUY and Mrs. Guy, Fulford Vicarage, York.

Capt. A. C. ST. CLAIR-MORFORD, M.C., R.M.L.I. (late R.A.F.), and Miss VICTORIA KIRKPATRICK, only daughter of Col. and the Hon. Mrs. Kirkpatrick, of Kilshannig, Mallow, Co. Cork, were married at St. James's Church, Spanish Place, on Monday, February 10.

To be Married

The marriage arranged between Maj. AUGUSTUS W. BIRD, D.S.O., R.A.F., and CLARICE MARY, only daughter of Mrs. BARTON FRENCH and of the late S. Barton French, of New York and Virginia, U.S.A., will take place at St. George's, Hanover Square, on Wednesday, February 19, at 2.30 p.m.

The engagement is announced between 2nd Lieut. LAURENCE C. H. CAVE, R.A.F., son of Capt. and Mrs. Charles Cave, of Ditcham Park, Petersfield, Hampshire, and DOROTHY MARY, daughter of Capt. and Mrs. JASPER GRAHAM MAYNE, Tumbricane, Ipswich.

The engagement is announced between Lieut. GEOFFREY KEITH CHATHAM, Northants Regt. and R.A.F., second son of the Hon. W. Chatham, C.M.G., D.P.W., Hong-Kong, and EDNA, only daughter of M. CHEVERTON-BROWN, C.C., of Withernsea, E.R., Yorks.

The engagement is announced of Capt. E. G. N. GRIMBLE, R.A.F., of Hong-Kong, to NELCA ALLAN, second daughter of Maj. and Mrs. W. A. CHAPPLE. The marriage will take place at St. Margaret's, Westminster, on Tuesday, February 18, at 2.15 p.m.

The engagement is announced of Lieut. NORMAN HEWIT, R.A.F., son of Mr. and Mrs. Edward Hewitt, Swinton Park, Manchester, and great-grandson of Sir Elkanah Armitage, and RUTH, younger daughter of Sir Tom and Lady Woodhouse, Fairfax House, Farnborough, Hants.

The engagement is announced of Major E. J. HODSOLL, R.A.F., only child of the late Capt. John Hodsoll, R.N.R., and Mrs. Hodsoll, and WINIFRED JOYCE, second daughter of Lieut.-Col. and Mrs. MORTON TOMLIN, Shawford, near Winchester.

The engagement is announced between Capt. CHARLES R. LYMN, R.A.F., only son of Mr. and Mrs. F. C. Lymn, Matlock Bath, Derbyshire, and Miss A. G. "NANCY" ARCHIBALD, second daughter of Mr. and Mrs. David Archibald, 2, West Mayfield, Edinburgh.

The engagement is announced between Capt. F. H. ST. CLAIR SARGANT, D.F.C., R.A.F., only son of Mr. and Mrs. Sidney Sargent, of Bank House, Sevenoaks, and DOROTHY CONSTANCE ARDEN, only daughter of the late Percy Arden SIMMONS and Mrs. Simmons, of Park House, Otford, Kent.

Items

Lieut. KENNETH MACLEISH, American Naval Flying Officer with 213th Aero Squadron, R.A.F., missing since October 14. Forced down near Lafinghe, Belgium. Subsequently natives reported American Naval Officer taken prisoner in that vicinity. Will anyone having information concerning the whereabouts or fate of Lieut. MacLeish, or information regarding the incident, please communicate with Rockwell, American Red Cross, London?

2nd Lieut. CLIFFORD J. TOLMAN, 22nd Squadron, was reported missing on September 27, 1918. Anybody who can give information concerning his fate is requested to write to Mrs. Grace Alverstone, Whippingham, East Cowes, Isle of Wight.



commercial aviation, and there was reason to believe that the ground would be more largely used by the public in the future. Opposition was raised by the London United Temperance Council on the ground that it would not be well for public and aviators to have facilities for obtaining drink. The Justices granted the application, and gave the option of taking a three-years' licence, which was accepted.

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Technical Branch.

Capt. R. Young to be Capt. (Grade A), from (A.); April 1, 1918.
Lieut. (Actg. Capt.) G. M. Garro-Jones to be graded for purposes of pay as Capt. (Grade B) while employed as Capt.; Dec. 18, 1918.
Lieuts. to be Actg. Capt. while employed as Capt.:—C. Murchie; July 31, 1918. W. S. Harms; Aug. 31, 1918.
Lieut. H. E. Went to be Actg. Capt. while employed as Capt. (Grade B); April 18, 1918.
Lieut. F. H. Holmes, M.C., to be Lieut. (Grade A), from (A.); Nov. 12, 1918.
Lieuts. (Ad.) to be Lieuts. (Grade B):—R. F. Sinclair; Dec. 21, 1918.
F. J. Kayser; Jan. 11.
Sec. Lieuts. to be Actg. Lieuts. while employed as Lieuts.:—P. S. Beaufort, J. V. Cook; Oct. 30, 1918.
To be Sec. Lieuts. (Grade A), from (Ad.):—R. W. Forsyth; Oct. 23, 1918. A. T. Guinevan; Jan. 2.
Sec. Lieut. E. C. Deeth to be Sec. Lieut. (Grade A), from (Grade B); Dec. 30, 1918.
To be Sec. Lieuts. (Grade B), from (Ad.):—C. Lewis; May 30, 1918. R. Wylie; Nov. 10, 1918 (substituted for notification in *Gazette*, Dec. 24, 1918). H. S. Smith; Dec. 3, 1918.

Sec. Lieut. C. F. Sweatman relinquishes his commn. on ceasing to be employed; Jan. 17.

The following are transferred to unemployed list:—Sec. Lieut. H. L. B. Buchanan; Jan. 3. Capt. W. Brass (Surr. Yeo., T.F.); Jan. 8. Capt. W. E. McConnell, Sec. Lieut. (Hon. Lieut.) C. H. Macnutt, Lieut. A. W. Payne; Jan. 10. Capt. R. Ferguson, Sec. Lieut. J. L. Malkin, Sec. Lieut. S. Marks; Jan. 11. Capt. G. Frecheville, Sec. Lieut. A. R. Mitchell; Jan. 12. Sec. Lieut. H. A. Scott, Lieut. W. E. G. Sillick; Jan. 13. Capt. V. F. P. Bryce, Capt. E. H. Cockshott, Sec. Lieut. F. Cohen, Sec. Lieut. H. Cohen, Lieut. E. B. Horlick, Sec. Lieut. H. Lloyd, Sec. Lieut. (Actg. Lieut.) G. G. Onions; Jan. 14. Sec. Lieut. T. B. Barnes, Sec. Lieut. (Hon. Lieut.) J. W. Bradford (Yorks. R., T.F.), Sec. Lieut. H. L. Copestake, Sec. Lieut. T. I. Grimes, Sec. Lieut. A. Rowland, Sec. Lieut. (Actg. Lieut.) J. E. Tod, Sec. Lieut. E. Ware; Jan. 15. Lieut. P. H. Clifford, Lieut. B. M. J. Davis, Capt. E. W. Stubbs; Jan. 16. Sec. Lieut. (Hon. Lieut.) C. N. Dove, Sec. Lieut. R. L. Finnis, Sec. Lieut. (Actg. Lieut.) S. D. A. Jolly, Sec. Lieut. A. H. V. Kingdon, Capt. (Actg. Maj.) W. C. Mitchell, Sec. Lieut. W. S. S. Wray; Jan. 17. Capt. T. G. Mackenzie, Sec. Lieut. W. H. Shorter; Jan. 18. Lieut. (Actg. Capt.) M. L. Horn, Lieut.-Col. A. E. J. Reiss, Sec. Lieut. (Hon. Lieut.) C. G. Sweet; Jan. 20. Sec. Lieut. K. Fraser; Jan. 21. Lieut. R. O. Clark; Jan. 23. Sec. Lieut. A. McCulloch; Jan. 27.

The following Sec. Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—R. T. Belville, D. I. D. Murray; Jan. 29.

The surname of Lieut. W. S. Mathews is as now described, and not as in *Gazette*, Jan. 14.

The notification in *Gazette*, Nov. 8, 1918, concerning Lieut. F. C. Elstob, is cancelled.

The notification in *Gazette*, Oct. 1, 1918, concerning Maj. J. W. K. Allsop, is cancelled.

Physical Training Branch.

The initials of Capt. (Actg. Maj.) B. T. Metcalfe are as now described and not as in *Gazette*, Jan. 14.

Medical Branch.

Lieut.-Cols. to be Lieut.-Cols. (Grade A):—E. O. B. Carbery, H. Cooper, E. C. Cridland, H. J. Hadden, N. H. Harris, R. H. Mornement, J. St. J. Murphy, T. Philip, W. H. Pope, N. J. Roche, H. E. South, H. V. Wells; Oct. 1, 1918.

The following Maj. (Actg. Lieut.-Col.) retain the actg. rank of Lieut.-Col. whilst employed as Lieut.-Cols. (Grade A):—G. N. Biggs, H. C. T. Langden, F. F. Muecke; Oct. 1, 1918.

L. B. Stringer (Temp. Surg.-Lieut., R.N.) is granted a temp. commn. as Capt.; Oct. 1, 1918, seniority April 1, 1918.

Chaplains' Branch.

The following are granted temp. commns. as Chaplains, with the relative rank of Capt.:—Rev. G. D. Jones (Temp. Chaplain to the Forces, 4th Cl., A.C.D.); Jan. 21. Rev. O. W. E. Grant (Temp. Chaplain to the Forces, 4th Cl., A.C.D.); Jan. 23.

Memoranda.

Maj. J. R. Bedwell, M.C., is granted the local actg. rank of Lieut.-Col. (without pay and allowances of that rank) whilst specially employed; Jan. 10.

Hon. Lieut. H. C. Myers is granted the hon. rank of Capt. whilst holding a special appointment at the Ministry of Munitions; Jan. 28.

The following are transferred to unemployed list:—Sec. Lieut. A. Gauld, from S.O.; Jan. 11. Lieut. R. R. Frecheville, from S.O.; Jan. 12. Capt. (Actg. Lieut.-Col.) G. Philippi (Bns., S.R.); Jan. 13. Maj. E. C. Fulton, from S.O.; Jan. 15.

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The following temporary appointments are made at the Air Ministry:—*Director of Medical Services.*—Col. M. H. G. Fell, C.M.G., and to be actg. Maj.-Genl. whilst so employed, vice Maj.-Genl. R. C. Munday; Jan. 7.

Deputy Director.—Maj. (actg. Lieut.-Col.) C. A. J. Butter, and to be actg. Col. whilst so employed; Dec. 28, 1918.

Staff Officers, 1st Class.—And to retain the actg. rank of Lieut.-Col. whilst so employed:—Maj. (actg. Lieut.-Col.) E. G. Mackenzie; Dec. 28, 1918. Maj. (actg. Lieut.-Col.) J. H. Lidderdale, vice Maj. (actg. Lieut.-Col.) C. A. J. Butter; Jan. 6.

Staff Officers, 2nd Class.—And to be actg. Maj. whilst so employed, if not already holding that rank:—Maj. C. S. MacNab; Dec. 30, 1918. Capt. (actg. Maj.) D. L. Blumenfeld; Jan. 1. Capt. (actg. Maj.) F. G. Stammers, O.B.E.; Jan. 6. (Air) Capt. A. R. Boyle, M.C., vice Capt. (actg. Maj.) C. M. Carrington; Jan. 10 (substituted for notification in the *Gazette* Jan. 24).

Staff Officers, 3rd Class.—And to be actg. Capt. whilst so employed, if not already holding that rank:—Lieut. J. Luncan; Nov. 1, 1918. Capt. S. T. Ravenscroft, Capt. S. M. Wood; Jan. 1. (P.) Sec. Lieut. (actg. Lieut.) E. G. Clement; Jan. 3.

The following temporary appointment is made:—*Deputy Director* (Graded for purposes of pay as Col. (Ad.)):—Lieut.-Col. I. Curtis, and to be actg. Col. whilst so employed; Nov. 26, 1918.

Flying Branch.

Capt. C. C. Darley to be actg. Maj. whilst employed as Maj. (A.); Dec. 19, 1918.

Lieuts. to be Lieuts. (A.) from Observer Officers:—H. B. Lilley; Sept. 9, 1918. R. C. W. Jervois; Nov. 5, 1918. J. H. Kirk; Dec. 13, 1918.

Sec. Lieut. L. C. Cody to be Sec. Lieut. (K.B.) from (Ad.); May 25, 1918.

Sec. Lieut. W. R. Hatfield to be Sec. Lieut. Observer Officer from (A.); Dec. 6, 1918.

The following relinquish their commns. on ceasing to be employed:—Sec. Lieut. (Hon. Lieut.) R. E. Shields (Lieut., C. Ont. R.); Dec. 6, 1918. Sec. Lieut. (actg. Lieut.) E. R. Wood (Lieut., Nova Scotia R.); Dec. 7, 1918. Lieut. R. G. Graham (Capt., Can. A.S.C.); Dec. 11, 1918. Lieut. F. C. Dickens (Lieut., Alberta R.); Dec. 13, 1918. Lieut. W. K. MacNaughton (Lieut., W. Ont. R.); Dec. 16, 1918. Lieut. W. B. Hutcheson (Lieut., Can. Engrs.); Dec. 24, 1918. Lieut. (Hon. Capt.) A. C. St. Clair-Morford, M.C. (Capt., R.M.L.I.); Jan. 7. Lieut. D. D. Dall (Lieut., C. Ont. R.); Jan. 8. Sec. Lieut. (Hon. Lieut.) H. Jardine (Lieut., Can. F.A.). Lieut. (actg. Capt.) E. E. Showler (Lieut., C. Ont. R.), Lieut. G. L. Ziegler (Lieut., W. Ont. R.); Jan. 10. Lieut. G. F. Hollington (Lieut., Sask. R.); Jan. 11. Lieut. (Hon. Capt.) J. A. Johnston, M.M. (Lieut., Manitoba R.); Jan. 21.

The following are transf'd. to unemployed list:—Lieut. J. Stuart; Jan. 5. Lieut. (Hon. Capt.) K. W. M. Pickthorn (Lond. R., T.F.); Jan. 6. Sec. Lieut. D. S. Anderson; Jan. 7. Sec. Lieut. H. J. Martin; Jan. 8. Lieut. H. S. Weston; Jan. 10. Capt. L. W. S. Cutler, Capt. (actg. Maj.) R. G. Heyn, O.B.E., Sec. Lieut. T. R. Michelson; Jan. 11. Lieut. W. F. Cleeve, Lieut. C. D. Gee (R.N.A.S.), Capt. N. M. Scott; Jan. 12. Lieut. G. S. Bourner, Lieut. N. W. Hastings, Lieut. F. W. E. Perry, Lieut. L. Phillips, Lieut. W. A. Slocock; Jan. 13. Lieut. (actg. Capt.) A. J. Salton, Lieut. M. E. Stutchfield (R.F.A., S.R.); Jan. 14. Sec. Lieut. H. W. Turton; Jan. 15. Lieut. A. J. Davis, Capt. R. E. Greensmith, Lieut. (Hon. Capt.) C. F. Hoyle, M.C. (Capt., Notts Yeo.), Sec. Lieut. M. M. McLean, Capt. R. St. C. Talboys; Jan. 16. Sec. Lieut. H. S. B. Aston, Sec. Lieut. W. A. Cowie, Sec. Lieut. C. L. N. A. Dunderdale, Sec. Lieut. C. Dyscn, Lieut. W. B. Ellis, Sec. Lieut. W. Gallaway (Yorks. R.), Lieut. J. B. Hinchcliff, Lieut. (actg. Capt.) S. T. Liversedge, Sec. Lieut. (Hon. Lieut.) N. H. MacNeil, Capt. (actg. Maj.) G. Mertson, Sec. Lieut. C. H. Reay; Jan. 17. Lieut. W. C. Balmford, Sec. Lieut. A. W. Emery, Lieut. R. B. Hooper, Sec. Lieut. A. O. Innis, Lieut. H. C. Kelly, Lieut. N. W. Kirkby (Yorks. R.), Lieut. (actg. Capt.) E. H. Marsden (R.F.A., S.R.), Sec. Lieut. G. H. Patey; Jan. 18. Lieut. A. O. Beckett (High. L.I.), Lieut. B. Dangerfield, M.C., Lieut. T. H. Davies, Lieut. P. T. Griffiths, Lieut. J. S. Johnson; Jan. 19. Lieut. J. W. Brown, Sec. Lieut. V. A. Eyles, Sec. Lieut. H. P. Gardner, Capt. D. R. Gawler, M.C. (R. Sco.), Sec. Lieut. W. J. Griffith (North'n R.), Sec. Lieut. K. E. Judd, Sec. Lieut. T. W. Lazenby, Sec. Lieut. N. H. Leech, Lieut. E. R. B. Playford (R.F.A.); Jan. 20. Lieut. R. Bayley (R.A.S.C., T.F.), Sec. Lieut. H. E. Fenton, Sec. Lieut. H. E. Filmer, Sec. Lieut. G. R. Hasselhuhn, Lieut. L. C. Keen, Sec. Lieut. H. V. Lawley, Sec. Lieut. N. R. Lewis, Sec. Lieut. (Hon. Lieut.) J. O. Robson, Maj. T. M. Rogers, Sec. Lieut. R. C. R. Wilde; Jan. 21. Lieut. D. M. Cameron (High. L.I.), Sec. Lieut. J. B. Hatley, Lieut. G. J. Maynard, Capt. C. C. Morley; Jan. 22. Sec. Lieut. H. R. Garnham; Jan. 23. Sec. Lieut. A. Homewood; Jan. 27.

Lieut. A. B. Raper relinquishes his commn., having been elected M.P.; Dec. 28, 1918.

Maj. H. B. R. Grey-Edwards, M.C., relinquishes his commn. on account of ill-health, and is permitted to retain the rank of Maj.; Feb. 1.

Capt. A. H. Allardye relinquishes his commn. on account of ill-health, and is permitted to retain the rank of Capt.; Feb. 1.

Capt. E. A. de Pass (Capt., Lond. Yeo., T.F.) relinquishes his commn. on account of ill-health contracted on active service; Feb. 1.

The following Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—A. L. Code (caused by wounds), J. A. McOnie, C. Oxberry (contracted on active service), W. L. Watt (contracted on active service); Feb. 1.

Lieut. G. A. Good (Sask. R.) relinquishes his commn. on account of ill-health; Feb. 1.

The following Sec. Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—A. E. Charman, E. A. Copp (contracted on active service), H. S. Dyson, G. B. Harper, E. P. Hulme; Feb. 1.

Sec. Lieut. H. Hill (R. War. R.) relinquishes his commn. on account of ill-health; Feb. 1.

Sec. Lieut. R. Cockburn resigns his commn., being physically unsuited for the duties of pilot or observer; Feb. 1.

The date of relinquishment of his commn. of Sec. Lieut. H. J. Sinclair is Jan. 14, and not as stated in *Gazette* Oct. 22, 1918.

The date of appointment of Sec. Lieut. C. H. Harwood as Sec. Lieut. (O.) is Aug. 25, 1918, and not as stated in *Gazette* Jan. 10.

The surname of Lieut. N. C. Ashton is as now described, and not Aston, as stated in *Gazette* Dec. 31, 1918.

Administrative Branch.

Deputy Director (graded for pay as Col.) Lieut.-Col. I. Curtis, and to be actg. Col. whilst so employed; Nov. 26, 1918.

I. Curtis, M.A., A.M.I.M.E. (actg. Chief Instr., R.N.) is granted a temp. commn. as Lieut.-Col.; Nov. 26, 1918, seniority from April 1, 1918.

Maj. J. M. Boyd to be actg. Lieut.-Col. while specially employed; July 20, 1918.

Maj. (actg. Lieut.-Col.) B. O. Jenkins, C.B.E., to be Maj., and relinquishes the actg. rank of Lieut.-Col., from (T.); Sept. 8, 1918.

Capt. to be actg. Maj. whilst employed as Maj.:—G. B. Chaney; Aug. 26, 1918. S. S. Macaskie, M. B. O'Brien, L. J. Robertson; Nov. 30, 1918.

Lieut. (actg. Capt.) H. J. L. Cappel to be actg. Maj while employed as Maj., from (T.); Aug. 8, 1918.

Capt. F. L. J. Shinley, M.C., to be Capt., from (A.); Oct. 3, 1918.

Sec. Lieut. (actg. Capt.) L. H. Secombe retains the actg. rank of Capt. while employed as Capt., from (T.); Aug. 19, 1918.

Lieuts. to be actg. Capt., while employed as Capt.:—H. B. Shephard; Aug. 2, 1918. F. J. Logan; Sept. 28, 1918. W. J. Matthews; Oct. 1, 1918. E. A. Coneau, from (T.), M. Tarbet; Jan. 11.

Sec. Lieuts. to be actg. Capt. whilst employed as Capt.:—O. G. Pike, from (T.); Dec. 9, 1918. (Actg. Lieut.) J. M. Moore, F. Rodney, from (K.B.), and to be graded for pay as S.O., 3rd Class; Jan. 1. (Actg. Lieut.) R. E. Roberts; Jan. 11. Lieuts. (A.) to be Lieuts.:—H. D. Wright, A. T. Wynyard-Wright; April 1, 1918. S. T. Stephens; July 9, 1918. W. A. B. Probert; Aug. 15, 1918. L. C. Messiter; Sept. 13, 1918. A. B. Bullock; Sept. 16, 1918. A. J. F. Behm; Sept. 26, 1918. B. C. Budd; Sept. 27, 1918. J. T. Andrews; Sept. 30, 1918. C. B. Godfrey; Oct. 18, 1918. W. L. Coleridge; Oct. 28, 1918. (Hon. Capt.) J. I. C. O. Gairdner; Nov. 12, 1918. G. W. E. Baker; Nov. 19, 1918. F. G. W. Taylor; Nov. 25, 1918. R. G. Robson; Nov. 27, 1918. W. D. Baird; Nov. 30, 1918. E. S. C. Brooks; Dec. 2, 1918. A. H. Bottrell, H. B. Hudson, M.C., G. S. Tindlin; Dec. 4, 1918. L. J. N. Mackay; Dec. 7, 1918. F. P. Lush; Dec. 19,

1918. N. D. Budgen; Dec. 30, 1918. Lieut. F. R. Hatch to be Lieut. (from K.B.); Aug. 26, 1918.

Lieuts. (O.) to be Lieuts.—L. V. Dell; Oct. 5, 1918. J. C. O'Rielly; King; Oct. 22, 1918. J. E. S. P. Bradford, M.C.; Oct. 23, 1918. L. F. Goodwin, M.C.; Oct. 28, 1918. A. H. Clegg; Nov. 28, 1918. L. V. W. Clark; Dec. 3, 1918.

A. A. Watson (Lieut., R.F.A., T.F.) is granted a temp. commn. as Lieut.: Nov. 4, 1918, seniority April 1, 1918 (substituted for notification in *Gazette*, Dec. 6, 1918).

Sec. Lieut. F. Dallow to be actg. Lieut. while employed as Lieut.; Nov. 10, 1918.

The following are transfd. to unemployed list:—Sec. Lieut. (Hon. Capt.) O. T. Burne; Jan. 1. Lieut. F. R. Dymond (K.S.L.I.); Jan. 9. Sec. Lieut. W. L. Oxley; Jan. 10. Sec. Lieut. L. E. S. Barrett; Jan. 15. Sec. Lieut. C. Longland, Sec. Lieut. (actg. Capt.) A. J. Thompson; Jan. 17. Sec. Lieut. C. W. Daniel, Capt. S. M. Minnie-Hawkins (Ox. and Bucks L.I.); Jan. 18. Sec. Lieut. (Hon. Capt.) G. T. Braggiotti, Lieut. (actg. Capt.) W. C. Hacon, Sec. Lieut. J. Harding, Sec. Lieut. A. T. Iles, Lieut. (actg. Capt.) H. M. Lewis; Jan. 19. Sec. Lieut. G. W. Biddle, Sec. Lieut. H. Coggins (Lond. R.), Lieut. (actg. Capt.) G. H. Hoyle, Sec. Lieut. (actg. Lieut.) J. W. Kennedy, Sec. Lieut. H. Murnaghan; Jan. 21. Sec. Lieut. J. A. Hynes, Sec. Lieut. W. H. North; Jan. 22. Sec. Lieut. H. J. Beale; Jan. 25. Capt. E. H. Bellew; Jan. 31.

Maj. V. Percy-Smith relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain the rank of Maj.; Feb. 1.

Lieut. M. Dodd relinquishes his commn. on account of ill-health, and is permitted to retain the rank of Lieut.; Feb. 1.

The following Sec. Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—R. H. Barker, W. Bolt, F. Nicolls; Feb. 1.

Sec. Lieut. G. Hutcheson resigns his commn.; Feb. 1.

The date of appointment of Sec. Lieut. (Hon. Capt.) J. D. Fitzgerald as actg. Capt. is Aug. 24, 1918, and not as stated in *Gazette*, Nov. 26, 1918.

The notification in *Gazette*, Sept. 24, 1918, concerning Sec. Lieut. (actg. Capt.) H. A. Maynard is cancelled.

Technical Branch.

Lieut. (actg. Maj.) W. W. Gibson, M.B.E., retains the actg. rank of Maj. whilst employed as Maj. (Grade B), from (Ad.); Nov. 2, 1918.

Lieut. S. L. Collins to be actg. Capt. whilst employed as Capt. (Grade A); Dec. 3, 1918.

Lieut. A. T. Wynyard-Wright to be actg. Capt. whilst employed as Capt. (Grade B), from (Ad.); Sept. 1, 1918 (substituted for notification in *Gazette*, Sept. 24, 1918).

Sec. Lieuts. (actg. Lieuts.) to be actg. Capt. while employed as Capt. (Grade A):—G. Baillie, C. H. Bell, W. Dentith; Nov. 1, 1918.

Sec. Lieuts. to be actg. Capt. whilst employed as Capt. (Grade B):—H. E. Haddon; Oct. 30, 1918. (Actg. Lieut.) P. H. Paul; Nov. 1, 1918.

Lieuts. (A.) to be Lieuts. (Grade A):—J. W. Thomson; Oct. 25, 1918.

E. Vredenburg; Jan. 25, 1918.

Lieut. W. H. Scanlan to be Lieut. (Grade A), from (K.B.); Nov. 25, 1918.

Lieuts. (O.) to be Lieuts. (Grade A):—C. A. Lunghi; July 11, 1918.

E. V. White; Dec. 6, 1918.

Lieut. E. C. F. O'C. Fenton to be Lieut. (Grade B), from (A.); Oct. 31, 1918.

Sec. Lieut. (actg. Lieut.) L. E. Carter retains the actg. rank of Lieut. whilst employed as Lieut., from (Ad.); May 15, 1918 (substituted for notification in *Gazette*, Sept. 17, 1918).

Sec. Lieuts. to be actg. Lieuts. whilst employed as Lieuts. (Grade A):—W. Wheatley; Sept. 3, 1918. S. R. Gellert; Sept. 18, 1918. W. Gill; Sept. 21, 1918. T. R. Parlow; Sept. 28, 1918. H. O. Keenan; Nov. 1, 1918.

Sec. Lieuts. to be actg. Lieuts. whilst employed as Lieuts. (Grade B):—O. N. H. Watson, (Hon. Lieut.) N. W. Watson; Aug. 15, 1918. W. L. Vining; Nov. 1, 1918.

Sec. Lieuts. to be actg. Lieuts. whilst employed as Lieuts.:—H. H. Fell, W. T. Henry, W. G. Shipwright, W. J. Walford; Oct. 30, 1918.

The following are transfd. to unemployed list:—Sec. Lieut. (actg. Lieut.) A. M. Cawthra; Jan. 11. Sec. Lieut. L. J. Davies; Jan. 15. Sec. Lieut. (Hon. Lieut.) J. W. Carroll, M.C. (Dur. L.I.); Jan. 16. Capt. R. A. Coote, Sec. Lieut. N. H. Jenkins; Jan. 17. Sec. Lieut. J. E. Adcock, Sec. Lieut. P. H. Benson, Lieut. C. A. Gladstone (unattached list, T.F.), Lieut. J. A. G. Harrison, Lieut. H. Maccoy (Lond. R.); Sec. Lieut. (Hon. Lieut.) C. A. H. Mason (E. Surr. R.), Lieut. (actg. Capt.) P. Middlemas, Sec. Lieut. (Hon. Lieut.) W. R. K. Ramsey; Jan. 18. Capt. W. B. Carnley, Sec. Lieut. E. L. Hopkins, Lieut. F. C. Wood; Jan. 19. Lieut. F. E. M. Bussy, Sec. Lieut. S. Dillingham, Sec. Lieut. H. H. Hawkins, Sec. Lieut. F. M. Hewett, Sec. Lieut. (actg. Lieut.) G. C. Moore, Capt. H. B. Neame; Jan. 21st. Lieut. S. W. Gilbey, Sec. Lieut. D. P. Jessup, Sec. Lieut. E. W. Mann; Jan. 22. Lieut. J. P. Barle, Sec. Lieut. (Hon. Lieut.) R. W. Hughman (Midd'x. R.), Capt. G. L. T. Owen; Jan. 23.

Maj. J. U. Kelly, D.S.O., relinquishes his commn. on account of ill-health, and is permitted to retain the rank of Maj.; Feb. 1.

The following Sec. Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—J. E. J. Crawford (contracted on active service), F. J. P. Disney, A. Gaze; Feb. 1.

The surname of Lieut. (actg. Capt.) F. B. Nicol is as now described, and not as stated in the *Gazette*, Aug. 27, 1918.

The notification in *Gazette*, Oct. 25, 1918, concerning Sec. Lieut. (actg. Lieut.) L. Butterfield is cancelled.

Chaplains' Branch

Rev. F. C. Cleaver (Temp. Chap. to the Forces, 4th Class, A.C.D.) is granted a temp. commn. as Chaplain, with the relative rank of Capt.; Jan. 28.

Establishments.

Central Flying School.—The following temporary appointments are made:—Instructors (Graded for purposes of pay as Majors) (Flying):—Capt. H. Meintjes, M.C., vice Capt. (actg. Maj.) J. C. Slessor, M.C.; July 14, 1918. Capt. J. C. B. Firth, M.C., vice Capt. W. E. Molesworth, M.C.; Sept. 4, 1918.

Memoranda

The following Capt. are confirmed in the rank of Capt.:—O. S. Stiles, B. A. Smart, D.S.O., C. Hanson-Abbott, A. F. E. Warner, J. A. Glen, D.S.C. D. S. Earp, G. M. Part, D. FitzG. Fitz-Gibbon, D.S.C., H. F. Stackhard, H. V. Drew, O. M. Ayrton, G. K. Cooper, W. H. Strettell-Miller, H. A. F. Belton, C. R. Vaughan, M. Faux, L. H. Wilkins, D.S.C., A. L. Taylor, J. L. A. Sinclair, G. L. E. Stevens, R. M. Bayley, R. S. Montagu, D.S.C., J. A. Macnab, G. G. Simpson, D.S.C., A. G. Woodward.

Sec. Lieut. W. C. Van Eeden is granted the hon. rank of Lieut.; Sept. 16, 1918.

Maj. (actg. Lieut.-Col.) J. T. C. Moore-Brabazon, M.C., relinquishes his commn. on ceasing to be employed; Dec. 28, 1918.

The following are transfd. to unemployed list:—Capt. (actg. Maj.) J. H. S. Annesley (from S.O.); Jan. 12. Capt. (actg. Maj.) M. J. C. S. Johnstone (Dragns.) (from S.O.); Jan. 17. Maj. W. A. Sedgwick (Bed. R.); Jan. 18.

Capt. W. H. Dallow; Jan. 20. Lieut. (actg. Capt.) E. N. Layton (from S.O.); Feb. 1.

London Gazette, February 4.

The following temporary appointments are made at the Air Ministry:—Staff Officer, 2nd Class.—(T.) Capt. C. F. Rasmussen, and to be actg. Maj. whilst so employed; Oct. 9, 1918.

Staff Officer, 3rd Class.—(P.) Capt. J. E. Morris; Jan. 24.

The following temporary appointments are made:—

Staff Officers, 1st Class.—(P.) A. M. Bent, C.M.G. (Lt.-Col. in Army), and is granted a temp. commn. as Col.; April 1, 1918 (substituted for notification in *Gazette*, May 3, 1918). (A.) Capt. (actg. Maj.) C. E. Wardle, and to be actg. Lieut.-Col. whilst so employed; Dec. 10, 1918.

Staff Officer, 2nd Class (Higher Grade).—(Air) Capt. J. Selwyn, and to be actg. Maj. whilst so employed; Dec. 20, 1918.

Staff Officers, 2nd Class (Lower Grade).—(Substituted for notification in *Gazette*, Jan. 10, page 518).—(P.) Maj. D. Illingworth; Dec. 13, 1918. Maj. A. P. Pargiter, M.C.; Dec. 24, 1918.

Staff Officer, 3rd Class (P.).—Capt. H. M. Ryland; Dec. 23, 1918.

Staff Officer, 4th Class (2nd Grade) (Air).—Lieut. C. P. Brady; May 15, 1918.

Flying Branch.

Maj. (actg. Lieut.-Col.) C. N. Murphy retains the actg. rank of Lieut.-Col. while employed as Lieut.-Col. (A), from S.O.; Jan. 25.

Maj. B. E. Sutton to be actg. Lieut.-Col. while employed as Lieut.-Col. (A); Jan. 6.

Capt. (Hon. Maj.) F. B. Binney to be Maj. (A.); Nov. 29, 1918, seniority April 1, 1918.

Lieuts. to be actg. Capt. while employed as Capt. (A):—L. J. Riordan; Aug. 1, 1918. D. H. Robertson, A.F.C.; Aug. 12, 1918. C. H. Howall; Sept. 1, 1918. C. D. Barnard, C. F. le P. Trench, J. H. Jephson, L. Wood; Oct. 1, 1918. A. P. Adams, D.F.C., T. O. Clogstoun, (Hon. Capt.) R. E. Eversden, H. Faull, E. F. Nash, W. J. Morgan; Nov. 17, 1918. A. L. Fiddament; Nov. 18, 1918. F. F. Dutton, M.C.; Nov. 28, 1918. F. W. Crawford, D. Price (Hon. Capt.) A. B. Wright; Dec. 1, 1918.

Lieuts. to be Lieuts. (A) from (O.):—A. K. A. M. Buschmann; Dec. 16, 1918. C. Knivator, M.C.; Jan. 3. O. S. Hinson; Jan. 15.

Sec. Lieuts. to be Lieuts.:—H. J. Fuller (A.); April 2, 1918. (Hon. Lieut.) M. R. Stack (A. and S.); June 28, 1918. A. Lilley (O.); Aug. 2, 1918. (Hon. Lieut.) S. T. Jerome, M.C. (O.); Aug. 13, 1918. (Hon. Lieut.) O. A. Peters (A.); Aug. 18, 1918. H. R. Tyler (A.); Aug. 27, 1918. (Hon. Lieut.) W. R. Steed (A.); Aug. 31, 1918. H. Etterley (O.); Sept. 1, 1918. P. A. Katte (A. and S.); Sept. 11, 1918. (Hon. Lieut.) J. J. Saunders (K.B.); Sept. 13, 1918. F. Neale (A.), J. McNamara, D.C.M. (A.), L. F. Ashley (A.); Sept. 28, 1918. H. G. Little (A.); Oct. 1, 1918. D. M. Thomas (O.); Oct. 22, 1918. R. E. Quesnel (A.); Oct. 24, 1918. A. P. Ledger (O.), A. B. Bedford (O.), J. C. H. Hartley (O.), E. A. Mallett (O.); Oct. 26, 1918. E. Kew (O.); Nov. 2, 1918. G. H. A. Hart (O.), A. L. B. Bennet (O.), T. Farrar (A.), R. M. C. Smith (A.); Nov. 30, 1918. H. T. J. Hynes (O.); Dec. 4, 1918. A. C. Watkins (A.), G. Thompson, M.C. (O.), D. H. Batty (O.), C. G. Cooper (A. and S.); Dec. 27, 1918. Hon. Lieut. H. L. W. Stevens (A.); Dec. 28, 1918. A. E. Gardiner (A.), (Hon. Lieut.) B. A. Whitmore (A.); Jan. 1. J. M. Ballard (K.B.); Jan. 2. J. Oliver (O.); Jan. 7. G. A. Hadley (A.); Jan. 19. J. F. P. Kirsten (A.); Jan. 29. (Hon. Lieut.) R. J. Baddeley (O.), H. G. Rowe (O.), A. W. Rogers, M.M. (O.), J. K. Pollitt (O.); Feb. 1.

Sec. Lieut. M. L. Williams to be Sec. Lieut. (A), from (O.); Dec. 24, 1918.

T. G. Keir is granted a temporary commn. as Sec. Lieut. (A.); July 28, 1918.

The following relinquish their commns. on ceasing to be employed:—Lieut. J. W. Cogg (Temp. Sec. Lieut., R. Berks R.); June 15, 1918. Lieut. J. B. Smith; June 16, 1918. Lieut. E. M. Farncomb (Lieut., C. Ont. R.); Dec. 9, 1918. Lieut. A. H. M. Copland (Capt., Can. A.S.C.); Jan. 2. Lieut. T. R. Knight (Lieut., New Bruns. R.); Jan. 8. Sec. Lieut. (Hon. Lieut.) H. E. Johnston (Lieut., Brit. Col. R.); Jan. 9. Sec. Lieut. F. H. Alder (Sec. Lieut., W. Can. Inf. Bde.); Jan. 10. Sec. Lieut. (Hon. Lieut.) J. F. Clement (Lieut., Alb. R.), Sec. Lieut. (Hon. Lieut.) R. W. Course (Lieut., W. Ont. R.), Sec. Lieut. (Hon. Lieut.) C. F. Day (Lieut., E. Ont. R.), Sec. Lieut. (Hon. Capt.) H. B. McKinnon (Capt., C. Ont. R.), Lieut. C. P. Thursby (Lieut., Man. R.), Sec. Lieut. (Hon. Lieut.) B. A. Whitmore (Lieut., Sask. R.); Jan. 11. Sec. Lieut. (Hon. Lieut.) A. Buckley (Can. Field Amb.); Jan. 12. Lieut. A. R. Oliver (Lieut., Que. R.); Jan. 13. Lieut. J. M. Ashby (Lieut., C. Ont. R.); Jan. 17. Sec. Lieut. (Hon. Capt.) A. E. Copland (Capt., Can. F.A.); Sec. Lieut. (Hon. Lieut.) K. Welton (Lieut., Can. F.A.); Jan. 20.

The following are transfd. to unemployed list:—Lieut. V. T. Boulger, Lieut. H. J. Palmer (Temp. Sec. Lieut., R.G.A.); Jan. 10. Lieut. R. H. Nixon; Jan. 11. Lieut. A. J. Price; Jan. 12. Capt. J. Cairns, M.C. (R.E., T.F.), Sec. Lieut. J. C. Ferguson, Lieut. D. S. McEachran; Jan. 13. Lieut. A. J. Arkell, M.C., Sec. Lieut. (Hon. Capt.) P. W. W. Armfelt (Lond. R., T.F.), Sec. Lieut. F. A. Gledhill, Lieut. R. T. B. Schreiber; Jan. 14. Lieut. W. M. Achery, Sec. Lieut. A. R. Giroux, Sec. Lieut. W. Jones, Lieut. A. Leiper, Lieut. D. J. Rollo, Lieut. H. L. Taylor; Jan. 15. Lieut. G. T. Bickerton, Lieut. R. S. Goddard, Sec. Lieut. H. E. Taylor, Lieut. C. F. R. Woolnough; Jan. 16. Lieut. R. D. Doane, Sec. Lieut. A. R. Robb, Sec. Lieut. J. H. Umney, Capt. N. O. Vinter, Lieut. G. Williams, Sec. Lieut. E. S. Willox, Sec. Lieut. H. N. Wood; Jan. 17. Lieut. D. J. Allardice, Lieut. W. R. B. Annesley (R.E.), Lieut. R. K. Brydon, Maj. A. Q. Cooper, D.S.C., A.F.C., Lieut. A. A. Duffus (High. Brig., R.F.A.), Lieut. C. E. Everard (Essex R.), Sec. Lieut. J. A. McAlpine, Lieut. W. H. Martin, Sec. Lieut. D. R. Morgan (Welsh R.), Sec. Lieut. (Hon. Lieut.) J. Robertson, Capt. C. W. Stamper; Jan. 18. Lieut. E. McL. Clelland, Lieut. A. N. Dupont (Leics. R.), Sec. Lieut. S. E. Farson, Lieut. J. G. Fullerton, Sec. Lieut. T. R. Green, Lieut. K. Jamieson (Lieut., Ayr. Yeo.), Sec. Lieut. A. Popini, Lieut. B. G. Porter, D.F.C., Lieut.-Col. F. K. McClean, A.F.C., Sec. Lieut. B. H. Redner, Capt. N. E. Woods; Jan. 19. Sec. Lieut. (Hon. Lieut.) G. Best (Glouc. R.), Lieut. T. G. Greenwell; Jan. 20. Sec. Lieut. L. D. Churchill, Sec. Lieut. E. J. Hardy, Sec. Lieut. (Hon. Lieut.) J. H. Jeffers (Lieut., R.F.A., S.R.), Capt. G. H. Lewis, D.F.C. (Lieut., North'n R.), Sec. Lieut. F. C. Morgan (Welsh R.), Sec. Lieut. H. J. Wood; Jan. 21. Lieut. M. K. Franks, Lieut. L. A. Garrett, Sec. Lieut. A. S. Green, Sec. Lieut. F. R. Irvine, Sec. Lieut. (Hon. Lieut.) A. G. Niven (Gord. Highrs., T.F.), Sec. Lieut. N. Offord, Maj. A. C. Wade; Jan. 22. Lieut. F. R. Alford, Sec. Lieut. S. V. Cutting, Sec. Lieut. P. C. Drummond, Sec. Lieut. R. A. Eldridge, Lieut. E. Evans, Sec. Lieut. A. S. Licence, Lieut. R. A. Martin, Lieut. H. Svendsen, Lieut. A. T. Walker; Jan. 23. Sec. Lieut. A. M. Allan, Sec. Lieut. E. H. Coote, Sec. Lieut. J. D. Henshaw, Sec. Lieut. J. C. Holdsworth, Lieut. (Hon. Capt.) C. M. Manson (W. Surr. R.), Sec. Lieut. J. E. Price, M.M. (Sask. R.), Lieut. S. T. Rowe, Lieut. R. J. Dashwood; Jan. 24. Lieut. (Hon. Capt.) P. A. E. Naylor (Rif. Bde.); Jan. 26.

Capt. A. G. L. J. Miller (Capt., Ir. Gds.) relinquishes his commn. on account of ill-health; Feb. 5.

The following Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—A. V. Blenkircn, M.C., W. A. Golding, W. C. Marsh (R. Berks R.), J. A. McFadden; Feb. 5.

The following Sec. Lieuts. relinquish their commns. on account of ill-

health, and are permitted to retain their rank:—H. H. Fitzsimmons (contracted on active service), J. W. Gray, C. J. Lewis: Feb. 5.

Sec. Lieut. R. H. Harlow relinquishes his commn. on account of ill-health: Feb. 5.

The following officers are antedated in their appointments as Sec. Lieuts. (A.), with effect from dates stated:—E. E. Muttly: Sept. 9, 1918. H. M. Best: Oct. 14, 1918.

The notification in *Gazette*, Jan. 24, concerning Lieut. C. B. Clark is cancelled.

The notification in *Gazette*, Jan. 21, concerning Lieut. H. C. Heintzman is cancelled.

The notification in *Gazette*, Jan. 24, concerning Lieut. (actg. Capt.) W. D. Patrick is cancelled.

Administrative Branch.

Capt. (actg. Maj.) P. Gadsby to be actg. Lieut.-Col. while employed as Lieut.-Col., and relinquishes his appointment as S.O. 2: Nov. 29, 1918.

To be actg. Maj. while employed as Maj.:—Lieut. (actg. Capt.) W. H. Bragg: Sept. 30, 1918. Sec. Lieut. (Hon. Capt.) (actg. Capt.) H. Milman: Nov. 1, 1918.

Lieuts. to be actg. Capt. while employed as Capt.:—(Hon. Capt.) W. H. Charlton: July 18, 1918. (Hon. Capt.) A. E. Brooks, J. B. Jackson: Sept. 1, 1918. M. Delaney: Oct. 1, 1918. A. R. Harris: Oct. 23, 1918. (Hon. Capt.) F. C. Clements: Oct. 26, 1918. L. C. Pockney (from A.P.) (T.), G. P. Scammell: Dec. 1, 1918.

Capt. G. B. Pratt to be Capt., from (A.): Nov. 12, 1918.

Sec. Lieuts. to be actg. Capt. while employed as Capt.:—H. Gambier: Oct. 7, 1918. E. R. Webb: Nov. 22, 1918. H. M. Drabble, from (T.): Dec. 1, 1918.

R. Hunter (Temp. Capt., W. Yorks R.) is granted a temp. commn. as Capt.: July 13, 1918, seniority April 1, 1918 (substituted for notification in *Gazette* Nov. 8, 1918).

Lieuts. (A.) to be Lieuts.:—J. H. Holland: Aug. 24, 1918. T. Ivison: Aug. 30, 1918. L. T. Lewis: Sept. 17, 1918. W. A. Tait: Sept. 20, 1918. J. L. Parren: Oct. 7, 1918. Actg. Capt. J. Harper: Oct. 18, 1918 (and relinquishes the actg. rank of Capt.). C. F. Muirhead: Oct. 30, 1918. A. MacD. Chalmers: Nov. 11, 1918. W. G. Harrell, D.F.C.: Nov. 20, 1918. H. J. W. Collins: Nov. 30, 1918. A. W. Chadwick: Jan. 22.

Lieuts. (K.B.) to be Lieuts.:—V. G. Barry: Oct. 21, 1918. J. A. B. Thompson, M.C.: Jan. 1.

Lieuts. (O.) to be Lieuts.:—(Hon. Capt.) H. J. Petty: Oct. 9, 1918. A. A. Savell: Nov. 7, 1918. H. D. Scowcroft: Nov. 18, 1918. C. A. R. Judd: Nov. 26, 1918.

Lieut. F. W. Dolman, from (S.), to be Lieut.: Nov. 25, 1918.

Sec. Lieuts. to be Lieuts.:—(Actg. Capt.) H. A. Maynard, and to retain his actg. rank: May 1, 1918. (Hon. Capt.) E. N. Thomas, and to retain his hon. rank: May 30, 1918. A. S. Windsor: July 20, 1918. F. H. Barratt: Nov. 4, 1918. A. H. Johnston: Nov. 11, 1918. E. Winter: Dec. 17, 1918. G. Allison-Beer: Dec. 21, 1918. H. J. Ough, W. R. Wood: Jan. 5. H. P. Bridges: Jan. 15. (Actg. Lieut.) E. L. Botham: Jan. 27. H. N. Turner: Feb. 1.

Sec. Lieuts. to be actg. Lieut. while employed as Lieuts.:—W. J. Collins: Sept. 13, 1918. H. D. Fletcher: Oct. 24, 1918. D. A. J. Buxton: Nov. 1, 1918.

V. M. McMahon, M.C. (Temp. Lieut., attd. R. Dub. Fus.), is granted a temp. commn. as Lieut.: April 1, 1918 (substituted for notification in *Gazette*, Nov. 8, 1918).

Sec. Lieuts. to be Sec. Lieuts., from (A.):—S. C. McLeod: June 12, 1918. J. Pughe-Jones: June 24, 1918. J. R. Quinn: Aug. 26, 1918. I. R. McCormack: Aug. 30, 1918. V. T. Lloyd-Davies: Sept. 18, 1918. H. C. Dakin: Sept. 19, 1918. T. W. B. Mill: Sept. 23, 1918. L. Skeldon, W. J. Baldwin: Sept. 26, 1918. W. J. Bedworth: Oct. 3, 1918. J. W. Pope: Oct. 5, 1918. C. W. Gracey: Oct. 23, 1918. D. H. Tyler: Nov. 14, 1918. S. H. Wood: Nov. 22, 1918. R. H. Rickards, C. F. W. Toone: Nov. 25, 1918. F. S. E. May: Nov. 27, 1918. D. J. Tarling: Dec. 2, 1918. F. M. Ruggles: Dec. 3, 1918. D. Cryan: Dec. 6, 1918. F. P. Dodsworth: Dec. 8, 1918. L. G. Cartwright: Dec. 14, 1918. C. E. Turner (Hon. Capt.): Dec. 16, 1918 (and to be Hon. Capt.). H. A. Campbell: Jan. 3.

Sec. Lieuts. to be Sec. Lieuts., from (A. and S.):—E. V. Evans: Nov. 22, 1918. A. J. Goring: Nov. 28, 1918. E. C. McCall: Dec. 1, 1918. L. C. Welch: Jan. 20.

Sec. Lieut. (Hon. Lieut.) E. St. H. Davies to be Sec. Lieut., from (K.B.): Oct. 24, 1918, and to be Hon. Lieut.

Sec. Lieut. I. Powell to be Sec. Lieut., from (T.): Jan. 15.

Sec. Lieuts. to be Sec. Lieuts., from (O.):—T. R. G. Cooke: June 27, 1918. L. F. Thurlow: Aug. 29, 1918. H. W. Derbyshire: Sept. 3, 1918. A. Golding: Sept. 19, 1918. W. Forbes: Sept. 20, 1918. H. Walker: Sept. 23, 1918. A. R. A. Millar: Oct. 9, 1918. C. H. Huntley: Oct. 14, 1918. G. I. Campbell: Oct. 30, 1918. P. James: Nov. 4, 1918. T. F. P. Llewellyn: Nov. 19, 1918. J. B. V. Clements, D.F.C.: Nov. 23, 1918 (and to be Hon. Lieut.). H. H. Watson: Nov. 23, 1918. M. Wallace: Nov. 24, 1918. G. F. Cunstance: Nov. 26, 1918. R. H. Norris: Nov. 28, 1918. W. H. Stanley: Dec. 5, 1918. J. R. W. Adamson: Dec. 6, 1918. A. T. Streeter, G. F. Sharp: Dec. 16, 1918. R. L. Aslin: Dec. 30, 1918 (and to be Hon. Lieut.). J. E. Saunders (Hon. Lieut.): Jan. 28 (and to be Hon. Lieut.).

Lieut. H. M. Beckwith-Towse (Lieut., L'pool. R.) relinquishes his commn. on ceasing to be employed: Jan. 16.

The following are transd. to the unemployed list:—Sec. Lieut. H. D. Arrowsmith, Capt. H. Ansell, Sec. Lieut. W. B. Barr: Jan. 10. Capt. F. A. Nimmo: Jan. 13. Actg. Capt. J. A. F. Henderson: Jan. 14. Sec. Lieut. H. L. A. Griffith: Jan. 15. Sec. Lieut. J. Atherton, Sec. Lieut. G. L. McLean: Jan. 17. Capt. C. H. F. Cookson, Lieut. H. F. W. Farquharson: Jan. 18. Capt. F. C. Sheppard: Jan. 19. Sec. Lieut. C. W. Edwards, Sec. Lieut. J. W. Martin, Lieut. L. Quartermaine: Jan. 20. Capt. W. T. Hill, Capt. G. S. M. Larder (Devon. R.): Jan. 21. Sec. Lieut. A. S. Houston: Jan. 22. Lieut. W. J. Gibson: Jan. 23. Sec. Lieut. G. Brazenale, Sec. Lieut. E. S. Brooks, Sec. Lieut. G. J. J. Matthews: Jan. 24. Sec. Lieut. D. Cairns, Sec. Lieut. S. M. Falconer, Lieut. E. W. Hadrill, Sec. Lieut. W. G. Illingworth: Jan. 25. Sec. Lieut. H. Elsee: Jan. 26.

Maj. H. P. R. Coode (Maj., R. of O., R.A.) relinquishes his commn. on account of ill-health: Feb. 5.

Sec. Lieut. O. W. Stokes relinquishes his commn. on account of ill-health, and is permitted to retain his rank: Feb. 5.

The notification in *Gazette*, Aug. 20, 1918, concerning Lieut. S. F. Culver is cancelled.

The notification in *Gazette*, Dec. 10, 1918, concerning C. Lyons is cancelled.

The notification in *Gazette*, Dec. 17, 1918, concerning Capt. (actg. Lieut.-Col.) H. W. Stratton is cancelled.

Technical Branch.

Capt. R. L. Charteris to be Capt. (Grade A.), from (A.): July 31, 1918. G. S. Ridgway (Lieut., R.N.) is granted a temp. commn. as Capt. (Grade P.): June 20, 1918 (seniority April 1, 1918 (substituted for notification in *Gazette*, Oct. 25, 1918).

Lieuts. to be actg. Capt. while employed as Capt. (Grade A.):—W. G. Murray: June 1, 1918. J. H. Mackie: Nov. 1, 1918. W. M. Arnot: Nov. 4, 1918. C. E. Nightingale: Dec. 1, 1918. G. M. Edmonston: Jan. 3.

Lieuts. to be actg. Capt. while employed as Capt. (Grade B.):—S. M. Campbell: Nov. 4, 1918. T. D. Jones: Dec. 1, 1918.

Sec. Lieuts. to be actg. Capt. while employed as Capt. (Grade A.):—L. Y. Cardall: Aug. 7, 1918. (Hon. Lieut.) (actg. Lieut.) P. L. Lindup: Nov. 4, 1918. (Hon. Lieut.) (actg. Lieut.) R. T. Lattey: Dec. 1, 1918.

Lieut. H. A. Braddock to be actg. Capt. (without pay and allowances of that rank while specially employed): Feb. 4.

Lieuts. to be graded for pay as Lieuts. (Grade A.):—C. H. Shelton: Aug. 1, 1918. R. C. S. Jamie: Sept. 1, 1918. E. C. Frisby, A. W. Judge: Oct. 1, 1918.

Lieut. W. S. Jamieson to be graded for pay as Lieut. (Grade B.): Nov. 1, 1918.

Sec. Lieut. (Hon. Lieut.) (actg. Lieut.) F. N. Trinder to be Lieut.: April 1, 1918.

Sec. Lieuts. to be Lieuts. (without pay and allowances of that rank):—(Hon. Lieut.) G. H. Whitaker (Hon. Lieut.) N. W. Watson, (Hon. Lieut.) A. F. St. J. Kinsey: April 2, 1918. A. H. Cray: Oct. 10, 1918. A. H. Stevens: Oct. 11, 1918. T. Kerr-Jones: Nov. 7, 1918. A. R. Russell, R. O. Mullinger: Jan. 19. C. W. Ware, C. S. Buckingham: Jan. 27. T. W. King, A. Stevens: Jan. 29.

Sec. Lieuts. to be actg. Lieuts. while employed as Lieuts. (Grade A.):—(Hon. Lieut.) F. Alexander, W. J. Harris: Sept. 1, 1918. (Hon. Lieut.) H. S. G. Jamieson: Sept. 23, 1918. (Hon. Lieut.) J. E. Jones: Oct. 1, 1918. H. Cantrill: Nov. 1, 1918. (Hon. Lieut.) L. H. Bainbridge-Bell, M.C., C. A. C. Fidler: Nov. 4, 1918.

Sec. Lieut. (actg. Lieut.) H. D. Lumb to be Sec. Lieut. (actg. Lieut.) (Grade A.), from (Ad.): Dec. 2, 1918 (substituted for notification in *Gazette*, Dec. 24, 1918).

Sec. Lieut. H. Barnes-Moss to be actg. Lieut. while employed as Lieut. (Grade B.): Nov. 1, 1918.

Sec. Lieut. R. A. Wright to be Sec. Lieut. (Grade A.), from (Grade B.): Jan. 23.

Sec. Lieuts. to be Sec. Lieuts., from (Ad.) (Grade B.):—V. Du B. Smythe: Oct. 8, 1918. A. W. Whistler: Dec. 1, 1918. H. T. Eachouse, G. H. Webb: Dec. 20, 1918. G. Ercole: Dec. 30, 1918. H. Seely: Dec. 31, 1918.

Sec. Lieut. F. C. P. Roberts to be Sec. Lieut. (Grade B.), from (A.): Aug. 20, 1918.

Sec. Lieut. A. E. Davies to be Sec. Lieut. (Grade A.), from (Grade B.): May 13, 1918.

Sec. Lieut. A. E. Davies, late Gen. List (R.F.C., on prob.), is confirmed in his rank as Sec. Lieut. (Grade B.): April 27, 1918 (substituted for notification in *Gazette*, Oct. 22, 1918).

The following are transd. to unemployed list:—Lieut. L. T. Clark: Jan. 10. Lieut. C. E. Crowley: Jan. 11. Sec. Lieut. H. D. Chalke: Jan. 15. Capt. J. D. Hodgson: Jan. 16. Capt. (actg. Maj.) H. A. Hall, Lieut. W. Hart-Smith: Jan. 17. Capt. E. I. M. Bird, Sec. Lieut. F. N. Gooding, Sec. Lieut. R. Kay: Jan. 18. Sec. Lieut. G. M. Guy: Jan. 19. Lieut. S. Gilfillan, Capt. W. A. Herbert, Sec. Lieut. A. E. D. Kennard, Sec. Lieut. (actg. Lieut.), (Hon. Capt.) J. R. B. Martin: Jan. 21. Sec. Lieut. G. Ashworth, Sec. Lieut. J. H. Fraser, Sec. Lieut. (Hon. Lieut.) H. A. Newman: Jan. 22. Lieut. J. Duchfield, Sec. Lieut. A. L. Hookham, Sec. Lieut. (actg. Lieut.) D. F. Hollins, Lieut. (actg. Capt.) A. L. Hyslop, Sec. Lieut. C. Lill, Lieut. (actg. Capt.) F. A. Mawdsley (Manch. R.): Jan. 2. Sec. Lieut. (Hon. Lieut.) J. A. Chown, Capt. J. Gardiner, Sec. Lieut. B. G. Imlach, Lieut. K. B. Lemon: Jan. 24. Lieut. L. H. S. Harben, Lieut. W. J. Hewitt, Sec. Lieut. J. J. Honan: Jan. 25. Sec. Lieut. G. M. Mavrogordato: Jan. 26. Lieut. (actg. Capt.) H. S. Hollings: Feb. 2.

Lieut. C. D. de Pinna (Lond. R.) relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank: Feb. 5.

Medical Branch.

C. F. Eminson is granted a temp. commn. as Lieut.: Feb. 1.

Maj. (actg. Lieut.-Col.) A. H. Cheate relinquishes his commn. on ceasing to be employed, and is permitted to retain the rank of Lieut.-Col.: Jan. 16.

The initials of Capt. B. A. Playne, D.S.O., are as now described, and not as stated in the *Gazette* of Nov. 26, 1918.

Chaplain's Branch.

The following temporary appointment is made:—Principal Chaplain for Presbyterians:—Rev. W. Moffatt (A.C.D.) is granted a temp. commn. as Chaplain, with the relative rank of Lieut.-Col., and is granted the relative rank of Col. whilst employed as Principal Chaplain: Jan. 1.

Memoranda.

2nd Lieut. J. Pughe-Jones is granted the actg. rank of Capt. (without pay and allowances of that rank) whilst specially employed: Feb. 4.

2nd Lieut. (actg. Capt.) W. Myers, M.C., D.C.M., to be Lieut., and retains the actg. rank of Capt.: Nov. 1.

2nd Lieut. P. H. Wellum is granted the hon. rank of Lieut.

Lieut. (actg. Capt.) R. N. Ball relinquishes his appointment as S.O. and actg. rank of Capt.: Dec. 14, 1918.

2nd Lieut. (actg. Lieut.) E. O. Johnson relinquishes his appointment as S.O. and actg. rank of Lieut.: Dec. 19, 1918.

Capt. C. F. Brightman is transferred to the unemployed list: Jan. 18.

Lieut.-Col. (Bt. Maj.) R. C. Donaldson-Hudson, D.S.O., relinquishes his commn. on account of ill-health: Feb. 5.

Capt. A. E. Hawker relinquishes his commn. on account of ill-health, and is permitted to retain his rank: Feb. 5.



The Sunbeam Aircraft-engined Cars and other

AMONG the new cars which are to be available as soon as conditions permit, one which should make a strong appeal to those whose inclination is for a mount of sporting type is the new Sunbeam 100 h.p. 6-cyl. car. It will be fitted with an engine closely following the lines of the Dyak aeromotor that has proved its efficiency and reliability in airship work.

For those who do not want such a high-powered car there will be available a Tourist Trophy sporting model carrying a 4-cyl. engine, 81 x 160 mm. bore and stroke, with four overhead valves driven by two overhead camshafts.

In addition there is to be a Sunbeam "Sixteen," while another new Sunbeam will be the "Twenty-four," with a 6-cyl. engine, 80 x 150 mm.

THE HEAT TREATMENT OF AERO ENGINE PARTS

IN no engineering sphere has the heat treatment of metals been brought to a finer or more scientific degree than in the aeronautical industry. The enormous strain placed upon modern aircraft renders it imperative that every metal component should be of the highest possible tensile strength compatible with lightness. The times when the hardening or annealing of steel could be left to the experienced eye of an operator are past, and much as we admire the wonderful skill of those men who can judge temperature by the "dull red" or other shades the metal assumes during the process of heating-up, we are bound to confess that it is entirely unscientific and inadequate to meet the modern demand for either output or efficiency, in which the limit of error in heating-up should be not greater than 5°C .

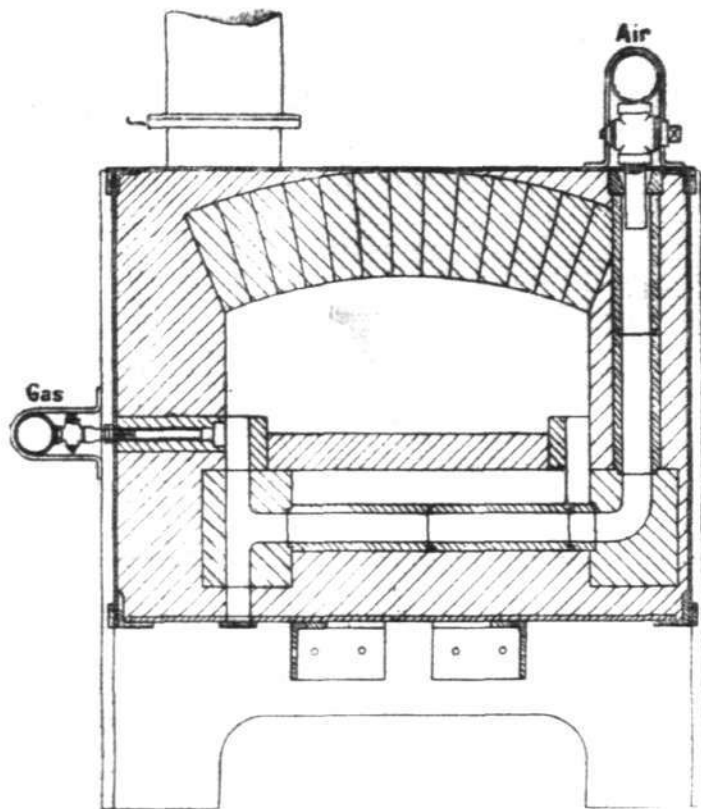


Fig. 1.—Cross section of a small "Richmond" L.P.G.A. furnace

The remarkable achievements of the modern gas-fired furnace will come as a revelation to those unfamiliar with the reliability of gaseous fuel for the heat treatment of steel and other metals used in aeroplane construction. When the demand for increased production became insistent, the numerous advantages of the gas furnace at once appealed. Speedily installed and connected up, a constant supply of fuel at a standard calorific value was always available. Compact, self-contained and mobile, the choice of position was practically unlimited allowing the furnace to be brought into close proximity to the machine worker. Accurate temperatures speedily attained, and readily maintained for any length of time, created the necessary conditions with which to successfully face the ever-increasing and exacting demand brought about by the War.

Among the many furnaces that have acquired distinction during the past four years, the "L.P.G.A." (low pressure gas and air) furnace, manufactured by the Richmond Gas Stove and Meter Co., Ltd., of Warrington, deserves special mention.

This type of furnace is "over-fired," i.e., the gas supply at normal town's pressure is led through ports at one or both sides, where it comes into contact with the air supplied (at approximately 2-in. water gauge) obtained from a small fan, which air has been previously well pre-heated by being taken through the opposite side of the furnace in fire-clay tubes, and then passed along the bottom of the furnace in close proximity to the hot waste products. Combustion takes place inside the working chamber round the furnace walls, the usual separate combustion chamber being absent. The flames produced keep well up and sweep round the arch. The products of combustion then pass to the opposite side of the furnace, are carried under the floor and up the other side, away to the flue. All the waste heat possible is utilised

in pre-heating the air. The expense of a positive pressure blower is eliminated, a fan only being required to induce the necessary draught.

Fig. 1 is a sectional view of this furnace, and it will be noticed that the "over-fired" principle of construction allows of a considerably thicker and stronger floor than in the case of an "under-fired" furnace, in which the heat has necessarily to pass through a comparatively thin floor tile. The thick floor permits of a very heavy charge being treated at one time, and Fig. 2 shows a "Richmond" L.P.G.A. furnace for heating 6 to 7 ton loads of bar steel. This particular furnace has during the past two years annealed 2,200 tons of steel (valued at £1,000,000) at a temperature of $1,000^{\circ}\text{C}$. for the aeronautical and allied industries.

It is claimed for this type of furnace that its special construction effects an economy in gas consumption of 25 per cent. Fig. 3 shows two of these furnaces, both of which are employed exclusively on aeroplane work.

The processes employed in the heat treatment of aero engine parts, etc., naturally vary according to the brand of steel provided. To procure the required strength and qualities, an exact heating formula must be either supplied by the steel makers or arrived at by a qualified metallurgist employed on the premises. In cases where large supplies of steel of numerous brands are constantly being used, the latter course is adopted by the large manufacturers of today. To give some idea of the work "Richmond" furnaces are performing, and the importance with which heat treatment is now regarded, it will be of interest to examine the opera-

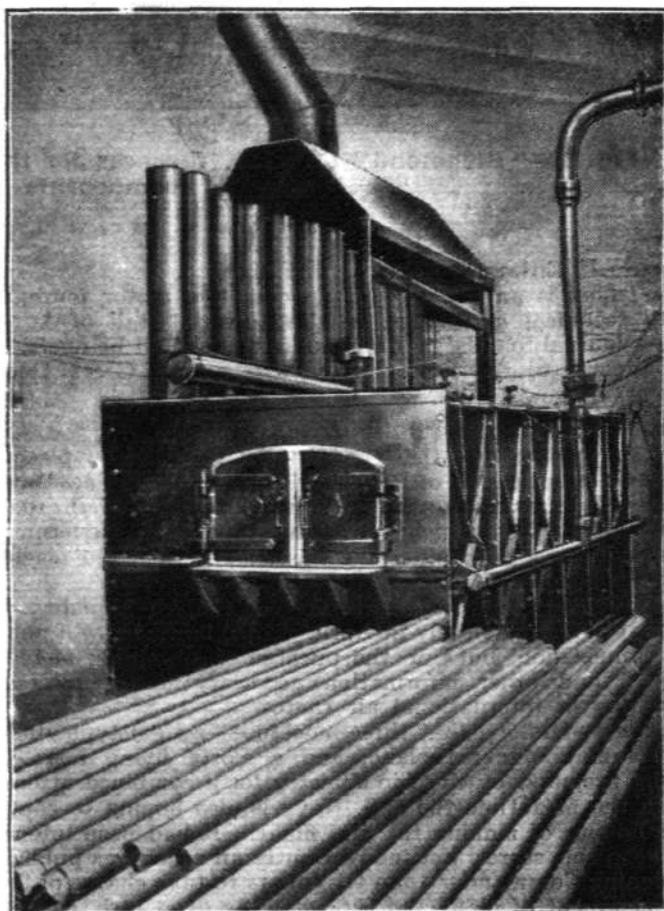


Fig. 2.—Large "Richmond" low-pressure gas and air furnace for annealing 6-7 ton charges of high-speed steel bars

tions involved in the preparation of a propeller cam-shaft, prior to being passed into the machine shop for finishing.

The stamping, which is of special steel, is first rough-machined, and a hole is bored through the shaft to ensure the oil reaching all parts when quenching takes place. Normalising is the first process; the shaft is heated to 780°C . and quenched in oil, again heated to 830°C ., and quenched in oil. The final heating is at 560°C . and the shaft is then quenched in water. The stamping is made of sufficient length to allow of test pieces being cut from either end, one of which is cut in half, one piece being examined for tensile strength, and the other subjected to an impact test; the remaining piece is tested for fracture. All requirements having been

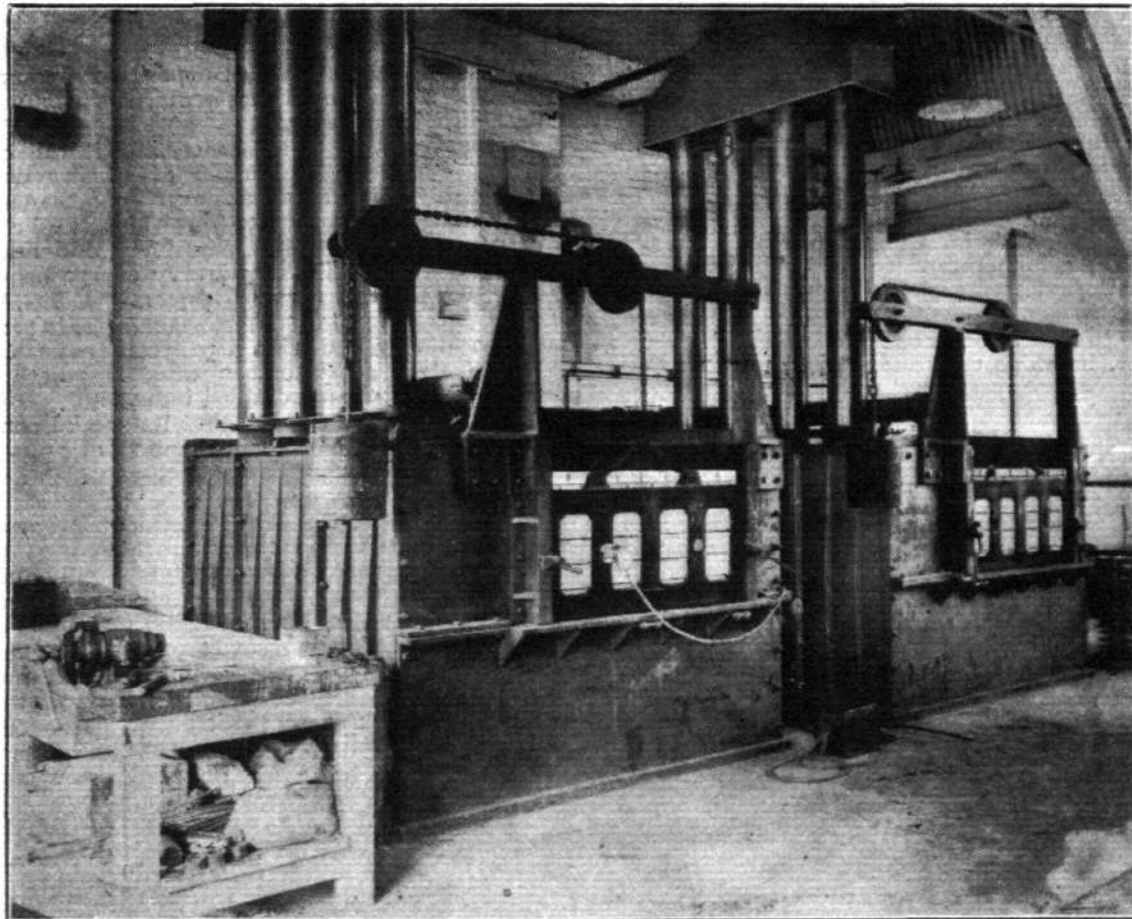


Fig. 3.—"Richmond" L.P.G.A. furnaces for the heat treatment of aero engine components

fulfilled, there still remains the "Brinell" reading to be taken at each end of the shaft; this process decides whether all parts have been evenly heated, and it is only when all these tests have been satisfactorily passed that the stamping is approved.

The heat treatment required in the preparation of propeller-shafts constitutes but one of a multitude of operations performed by the aid of gas. Connecting-rods, crank-shafts, cylinders, cam-plates, valves, supports, bearer-plates, gear-wheels, propeller noses, spur wheels, pinions, etc., all are heat-treated in various types of "Richmond" gas furnaces, besides the hardening of high-speed steel tools required for the wide range of turning, planing and boring machinery used in aeronautical workshops. The measure of success associated with the extensive adoption of gas for the numerous and intricate heating operations is reflected in the stability and wonderful endurance of our present-day machines.

"Auto." Editorial Staff

THERE is an opening for a good, live motor journalist with technical knowledge, on the Editorial staff of AUTO., sister journal to *Flight*. Communication should be made, in confidence, to the Editor, the AUTO, at 36, Great Queen Street, Kingsway, W.C. 2.

The Transatlantic Flight

It is understood that the Air Ministry will now place no difficulties in the way of Royal Air Force pilots and navigators who wish to make an attempt to win *The Daily Mail* £10,000 prize. Any firm which can spare time from Government contracts may now undertake the construction of a machine for this purpose.

An attempt, under the auspices of the Air Ministry, will probably be made early in April. This, however, will not be in competition, but for the purpose of obtaining meteorological and other information necessary for the successful planning of international air routes.

It is understood that three machines—a rigid type airship, a Handley-Page aeroplane, and a Porte flying boat—are being prepared by the Air Ministry for a combined attempt.

In the meantime the U.S. Navy is also hoping to capture the honour of making the first flight. It had been intended to keep this secret, but inadvertently an order was published assigning Commander John G. Towers to take charge of "the development of plans and the assembly of material and personnel for the proposed transatlantic flight." Practically no details have been published, but it is not unlikely that the large Curtiss flying boat will be used, and June is considered a good month for the attempt to be made.

According to messages from New York, the Swedish pilot, Capt. Hugo Sunstedt, is at present at Bayonne, Newark Bay, New Jersey, tuning up a machine which he hopes to fly across the Atlantic this month. The seaplane is driven by two six-cylinder Liberty engines. The upper wing plane spans 100 ft., the lower 71½ ft. The total lifting surface is 1,537 sq. ft., and the weight just over 4½ tons. The tanks hold two tons of petrol.

The Farman Goliath Visits London.

THE Farman Goliath twin-engined biplane has now paid its flying visit to London. It left Toussus-le-Noble (Seine-et-Oise) at 11.15 a.m. on February 8, and arrived at the Kenley aerodrome, near Croydon, at 2.30 p.m. It was piloted by

Lieut. Boussotrot, and among the 13 other military passengers on board was Sergeant M. Chevallard, who was well-known at Hendon in pre-War days. The party returned to Paris on the following afternoon, leaving Kenley at 1.40 p.m., and landing at Buc at 3.50. Photographs and some particulars of the machine appeared in our issue of January 30.

The Flying Lady Doctor

IN connection with her visits of inspection Dr. Letitia Fairfield, Director of Medical Services to the W.R.A.F., travels from aerodrome to aerodrome by aeroplane. On Feb. 6th she flew in a Handley-Page machine from Sleaford to Stamford.

Duchess of Aosta's Flight.

ON the morning of February 5 the Duchess of Aosta flew from Rome to Naples, and lunched at the Palace of Capodimonte. In the afternoon she went by air to Terracina, whence she returned to Rome by motor car.

An Air Raid on Oporto

THE Republican party in Portugal has now enlisted the aid of aeroplanes to combat the activities of the Royalists. A message from Oporto states that two Republican aeroplanes have bombed and damaged the railway line between Epinho and Granja. Proclamations were also dropped on Oporto. The machines appear to have been damaged, but succeeded in reaching their aerodrome.

Germans Use Thistle Fibre Fabric

BEFORE the Armistice was signed German aeroplane manufacturers were not finding it easy to get supplies of aeroplane fabrics, and it is stated that on some of the machines used towards the end of hostilities the wing coverings were made of thistle fibre, which is described as being only approximately half the strength of linen. It is also stated that, owing to the shortage of rubber in Germany, the only part of the aeroplane made of this material were the tyres, and these were of reclaimed rubber. Necessity truly is the mother of invention.

Italian Pilot Killed in the U.S.

FROM Dayton, Ohio, comes the news that Lieut. Pierelli, the distinguished Italian airman, was killed there on February 4. A single-seat aeroplane in which he was flying fell to earth from a height of 200 ft.

SIDE-WINDS

THE "Victory" number of *Mayfair*, just issued, contains quite a gallery of cartoons by "Spy" (Sir Leslie Ward), among others being characteristic presentations of Mr. Claude Johnson, the late Hon. C. S. Rolls, Mr. F. H. Royce, Mr. G. H. Roberts (the Minister for Labour), Sir Albert Stanley (the President of the Board of Trade), and Mr. W. H. Allen. There is also a fine vigorous cartoon of the Right Hon. D. Lloyd George by Mr. Ambrose McEvoy, and a full-page portrait of Col. Sir Charles Wakefield. In addition to a number of articles by Viscount Bryce, Lord Desborough, the Right Hon. J. R. Clynes, M.P., Sir Gilbert Park, Mr. Frederick Harrison, Mr. Jerome K. Jerome, etc., several sections of the paper deal with the work of firms who have played a leading part in the War, among others so treated being Messrs. Rolls-Royce, the Austin Motor Co., and Messrs. W. H. Allen and Co.

THE Western Australian Insurance Co., Ltd., 45-47 Cornhill, E.C., is prepared to quote for all insurance against all risks arising out of aviation. This company claims to be one of the pioneer offices in aircraft war risks, and the enterprising management is not willing to be behind in catering for this class of insurance under Peace conditions.

WE understand that the Newall Engineering Co., which, during the latter part of the War, was taken over by the Ministry of Munitions and operated as a National Gauge Factory, has now reverted to its former proprietors, Messrs. Peter Hooker, Limited. Accordingly, it is understood that the Company intends to reorganise and develop its well-known pre-War business in gauges, micrometers and measuring machines, together with additional specialties which will shortly be announced.

The Newall Engineering Co. has appointed Captain R. J. Bray, Director of the Machine Tool Section, Aircraft Production Department, as General Manager, and very interesting developments are anticipated.

SIR CHARLES C. WAKEFIELD, Bart., added to his collection of souvenirs of the Great War at the Coliseum matinée in aid of the National Institute of Journalists' Fund, in the shape of the autographed copy of President Wilson's Fourteen Points, which was eventually knocked down to him, by Mr. George Robey, for 110 guineas.

THE EAST LONDON RUBBER Co., 29-33, Great Eastern Street, London, E.C. 2, announce that their closing time has now been extended from 5.30 p.m. to 6 p.m. They also ask their friends to note their new telegraphic address, "Akerene-Phone, London."

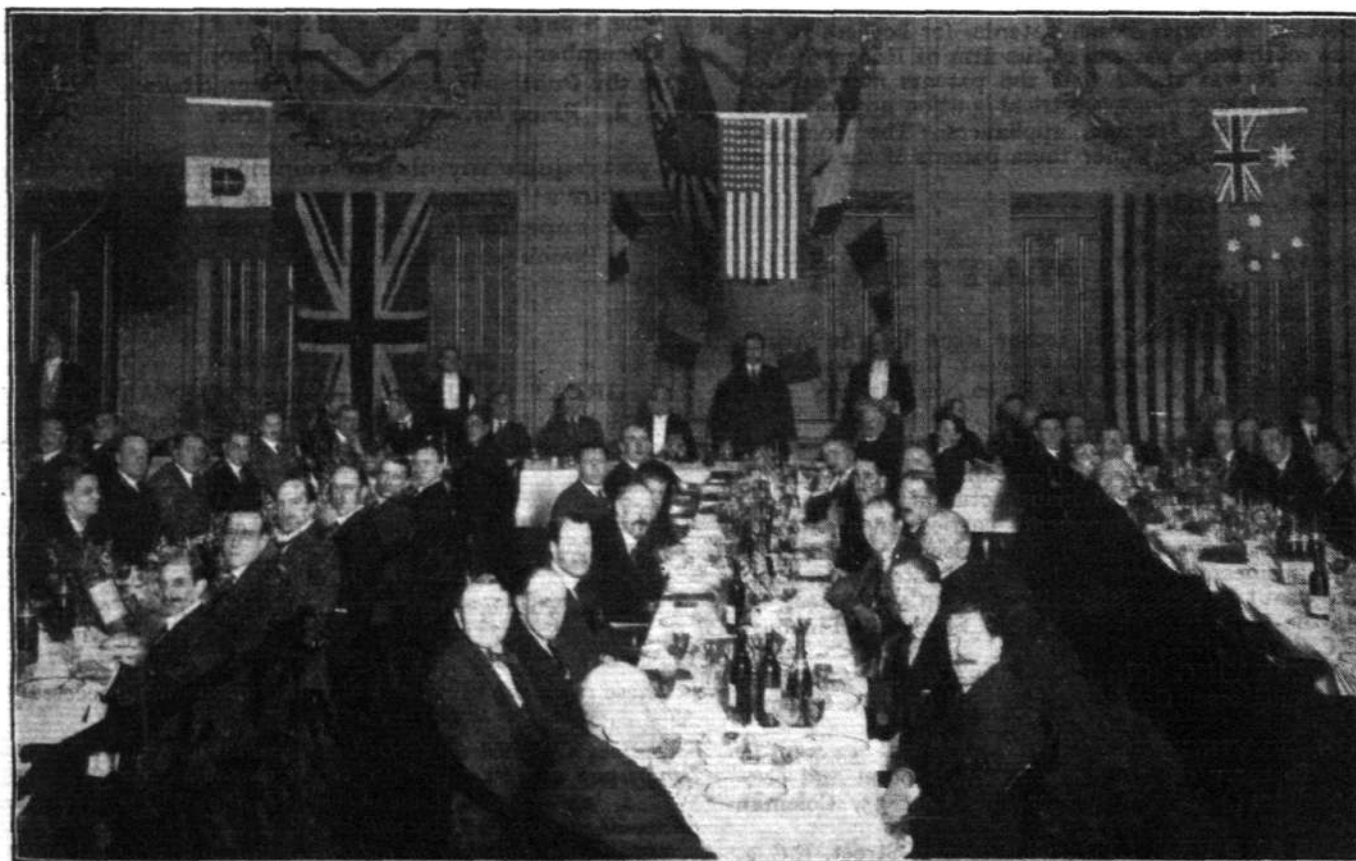
IN connection with the photograph of one of the machines used for the Peace Conference aeroplane service between London and Paris, illustrated in our issue of January 23, we understand that the machine was one of a considerable number of D.H. 4's, turned out by Palladium Autocars, Limited. Incidentally, it will doubtless be of interest to a good many pilots who require a light car to know that this firm are turning their attention to the production of such a vehicle built on standardised lines and to sell at a price equivalent to the £100 pre-War car.

ANYTHING which tends to lengthen the life of small drills is welcome in the workshop, and for that reason alone a little device which Messrs. Brown Brothers, Ltd., are selling should be in steady demand. It is called the Central Drill Protector, and consists of a length of hard brass drilled from one end to the other, with about three-quarters of its length slotted on one side. The protector is slipped over the drill, only leaving exposed a sufficient length of drill for the depth of hole required. It is very simple, and, as its cost is very small, it pays for itself within a very short time. Messrs. Brown Brothers, Ltd., 22-34, Great Eastern Street, London, E.C. 2, will be pleased to send particulars to anyone interested.

THE "ASCOL" VICTORY DINNER

By way of commemorating the successful prosecution of the War and to mark the entry of "Ascol" House into the motor accessories industry, the Aircraft Supplies Co., Ltd., entertained their friends to dinner at the Connaught Rooms on February 7. Mr. G. H. Mansfield, the Managing Director, was in the chair, and after the loyal toasts had been

duly honoured he proposed "The Royal Air Force," and paid a tribute to the wonderful work of the flying officers in hastening on the successful end of the War. Maj. J. H. Ledebour, R.A.F., in replying, thanked the aircraft industry for the sacrifices it had made, without which the R.A.F. could not have carried on its work. Mr. R. D. F. Paul proposed "The



At the "Ascol" Victory Dinner last week, Mr. G. H. Mansfield, Managing Director, in the Chair.

Motor Industry," to which Mr. Claude Johnson, Managing Director of Rolls-Royce, Ltd., replied. Mr. Johnson recalled that in the early days of the automobile movement there was a select band of owners of private cars who, whenever they met round a table, drank the toast of "Petrol—God bless it!" He emphasised briefly the great work which had been done by petrol motors during the War, at sea, on the road and in the air, and said it was difficult to estimate the magnitude of the share which they had taken in the great victory, except by endeavouring to imagine what would have been the state of affairs had they been absent. British motors would, he felt certain, take an equally prominent position in commerce, on land and in the air, in the future, provided the British workmen showed their balance and sanity and co-operated wholeheartedly in securing and keeping for the British Empire, motor supremacy. Mr. Henry C. Knox proposed "The Aircraft Industry," to which Mr. F. Handley-Page, C.B.E., replied. He said that as a member of the liquidation committee which dealt with the settling up of war contracts, he made the interesting discovery that contracts relating to aircraft work exceeded in value the whole of the other contracts dealt with by the Ministry of Munitions for tanks, guns and shells. He hoped that the widest possible freedom would be given to every sort of enterprise to deal with the development of commercial flying. There were two ways in which the new industry might be developed. One was by careful legislation and organisation beforehand. The other was to allow the new art to develop by what one might call natural selection. The aircraft industry was now at the turning of the ways. They must determine what course should be adopted. The same conditions which had made England in the past the foremost sea Power by reason of her maritime situation would inevitably cause her to remain the first air Power in the world. The long distances from Britain's Metropolis to the Colonies must call for increased communication such as the aeroplane alone could provide. The spirit of enterprise still lived in these islands, and he could safely say that in the aeroplane industry there existed the same spirit which made the shipbuilding trade of the country prominent, and they could look forward with certainty to the day when the white wings of England's aerial fleet would have just the same prominence the world over as her wooden walls in the days of Nelson.

LEGAL INTELLIGENCE

The Bosch Patents

In the Patents Court on February 7 the Comptroller-General of Patents (Mr. H. Temple Franks) heard an application made by the British Lighting and Ignition Company, of Tottenham Court Road, London, who had already been granted licences for other Bosch patents, for licences to use forty of the mechanical patents of the firm of Robert Bosch, of Stuttgart. It was stated that the patents now applied for related to sparking plugs, electrical ignition apparatus for motor vehicles, and starting appliances. The company proposed to manufacture under these patents if the licences were granted.

The licences were granted.

COMPANY MATTERS

Austin Motor Co., Ltd.

It is announced that the recent issue by the Austin Motor Co., Ltd., of 1,000,000 6 per cent. cumulative "B" preference shares of £1 each has been very largely over-subscribed.

NEW COMPANIES REGISTERED.

ARGONAUT NUT CO., LTD.—Capital £7,500, in £1 shares. Acquiring business of manufacturers of nuts, bolts and aircraft and motor components carried on at Roman Works, Claxton Grove, Fulham, and elsewhere; also to acquire the business carried on by W. H. Reynolds, Ltd., as the "Argonaut Nut Co.," at Belts Street, Cable Street, St. George's-in-the-East. Solicitor: C. R. Steele, 6, Finsbury Square, E.C.

HENDON FLYING CLUB, LTD.—Capital £2,000, in £1 shares. Solicitors: George Reader and Co., 35, Coleman Street, E.C.

LONDON FLYING CLUB, LTD.—Capital £2,000, in £1 shares. To carry on a flying club at Hendon and elsewhere. Solicitors: George Reader and Co., 35, Coleman Street, E.C.

WILLIAMS AND FRY, LTD., 68, Coleman Street, E.C. 2. —Capital £5,000, in £1 shares. Manufacturers of and dealers in automobiles, flying machines, electrical goods, etc. First directors: A. M. Williams and P. G. Fry.

IMPORTS AND EXPORTS, 1918-1919.

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910). For 1910 and 1911 figures see "FLIGHT" for January 25, 1912; for 1912 and 1913, see "FLIGHT" for January 17, 1914; for 1914, see "FLIGHT" for January 15, 1915; for 1915, see "FLIGHT" for January 13, 1916; for 1916, see "FLIGHT" for January 11, 1917; for 1917, see "FLIGHT" for January 24, 1918; and for 1918, see "FLIGHT" for January 16, 1919.

	Imports.		Exports.		Re-exportation.	
	1918.	1919.	1918.	1919.	1918.	1919.
	£	£	£	£	£	£
January ...	49,402	555,989	24,765	57,571	—	—

PUBLICATIONS RECEIVED

Aeronautics Made Easy. By Capt. W. G. Aston, R.A.F. London: Iliffe and Sons, Ltd., 20, Tudor Street, E.C. 4. Price 4s. 6d. net.

Technical Institutions' Conference. Memorandum on Patent Law Amendment. London: Institution of Mechanical Engineers, 11, Great George Street, S.W. 1.

Catalogue

Aircraft and Motor Fittings. B. G. L. Metal Components. The Birmingham Guild, Ltd., Great Charles Street, Birmingham.

Aeronautical Patents Published

Abbreviations:—cyl. = cylinder; I.C. = internal combustion; m. = motors.

APPLIED FOR IN 1917

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published February 6, 1919
15,570. S. LEECH. Jet propeller for flying machines, etc. (121,980.)
18,180. J. G. JACKSON. Airplanes. (121,990.)

APPLIED FOR IN 1918

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published February 6, 1919
1,866. L. LIGHTMAN. Jigs for use in manufacture of aeroplane ribs. (122,060.)
1,995. G. ANDERSON. Inclination indicator. (122,061.)
4,617. H. F. WILSON. Aeroplanes, seaplanes, etc., for fighting purposes. (122,080.)

Published February 13, 1919.
3,112. J. E. THOMPSON. Aeroplane propellers. (122,302.)
4,901. A. G. FRANCE. Turnbuckles or wire-strainers. (122,325.)

Index and Title Page for Vol. X.

The 8-page Index for Vol. X of "FLIGHT" (January to December, 1918) is now ready, and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C. 2. Price 8d. per copy, post free.

"If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week (see pages lv, lvi, lvii and lviii).

FLIGHT

and The Aircraft Engineer.

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12 " " " " " " " "	28	2	12 " " " " " " " "	33	0

These rates are subject to any alteration found necessary under war conditions.

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